PHOTOFACT* FOLDER SET

*TRADE MARK

NO. 102

CONTENTS

TRADE NAME AND MODEL	SET AND FOLDER NO.
AUTOMATIC	
C300	102-1
CLARION Tel. Rec.	
16703	102-2
CORONADO	
05RA37-43-8360A	102-3
DAVID BOGEN	
DB-10	102-4
DEWALD	
D-616	102-5
EMERSON	
646A (Ch. 120121A) 646B (Ch. 120121B)	102-6
MOTOROLA	
6L1, 6L2 (Ch. HS-226)	102-7
16F1 (Ch. TS-60 and Radio Ch. HS-234) Tel. Rec.	102-8
16K2 (Ch. TS-74) Tel. Rec.	102-8
16T1 (Ch. TS-60) Tel. Rec.	102-8
OPERADIO	
4A30-A	102-9
4A50-A, 4A51-A	102-9
PHILCO	
51-934	102-10
RCA VICTOR	
BX55 (Ch. RC-1088)	102-11
BX57 (Ch. RC-1088A)	102-11
SILVERTONE Tel. Rec.	
101 (Ch. 549.100) 101A (Ch. 549.100-1)	102-12
108 (Ch. 549.100)	102-12
SPARTON Tel. Rec.	
5002, 5003 (Ch. 23TD10)	102-13
5006, 5007 (Ch. 23TD10)	102-13
STEWART-WARNER	
9152-A, 9152-B, 9152-C	102-14
TRUETONE	
D1046A	102-15
VM Record Changer	
406, 407	102-16

The PHOTOFACT Servicer

July 26, 1950 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Vol. 11, Nos. 101 & 102

"Nothing So Needs Reforming As Other Peoples Habits" (Mark Twain)

New-Additions to
RMA Production Source Code
(Since-January-1950)
(For Reference - See PHOTOFACT Servicer,
Sets No. 70 and 92)

We suggest you mark this Servicer in Set No. 70 as follows: "For Numbers 622 to 654, inclusive, see Photofact Servicer Set No. 92". For-numbers-655T-681, see Photofact Service Set #102.

655 - J. A. Maurer, Inc., Long Island City 1, N. Y.
656 - Orsyd Company, Detroit 10, Michigan
657 - Lowell Metal Products Corporation, St. Louis 7, Mo.
658 -* Sangamo Electric Company, Marion, Illinois
659 - John R. Hollingsworth Corporation, Clifton Heights, Penna.
660 -* Electrical Assemblies, Inc., Grand Haven, Mich.
661 -* Audio Development Company, Minneapolis 7, Minn.
662 - Weller Manufacturing Company, Easton, Penna.
663 - Mercury Radio & Television Corp., Chicago 5, Ill.
664 -* Ideal Machine Shop, Bayshore, Long Island, N. Y.
665 - Penn Transformer Corporation, Bellefonte, Penna.
666 - Hudson Wire Company, Winsted, Conn.
667 - Arcturus Electronics, Inc., Newark 4, N. J.
668 -* Standard Electrical Products Co., Dayton 2, O.
669 - Advance Transformer Company, Chicago 40, Ill.
670 - Glaser-Steers Corporation, Belleville, 9, N. J.
671 - S. M. A. Company, Chicago 25, Ill.
672 - Thomas Electronics, Inc., Passaic, N.J.
673 - Ampro Corporation, Chicago 18, Ill.
674 - Shoup Engineering Company, Chicago 16, Ill.
675 - Electronic Industries Inc., Springfield, O.
676 - Penn Boiler and Burner Mfg. Corp., Lancaster, Penna.
677 -* Rogers Electronic Corp., New York 12, N. Y.
678 - Rhode Island Insulated Wire Co., Inc., Cranston, R. I.
679 -* Tech-Master Products Company, New York 13, N. Y.
680 - Conrac, Inc., Glendora, Calif.
681 - American Lava Corporation, Chattanooga 5, Tenn.

* Indicates Non RMA Member

FIELD EXPERIENCES

For every "Field Experience" published, we issue a certificate good for one PHOTOFACT Folder Set. Awards are issued at the time of publication. Since it is impossible to verify the accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or the results which will be obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Co., Inc.

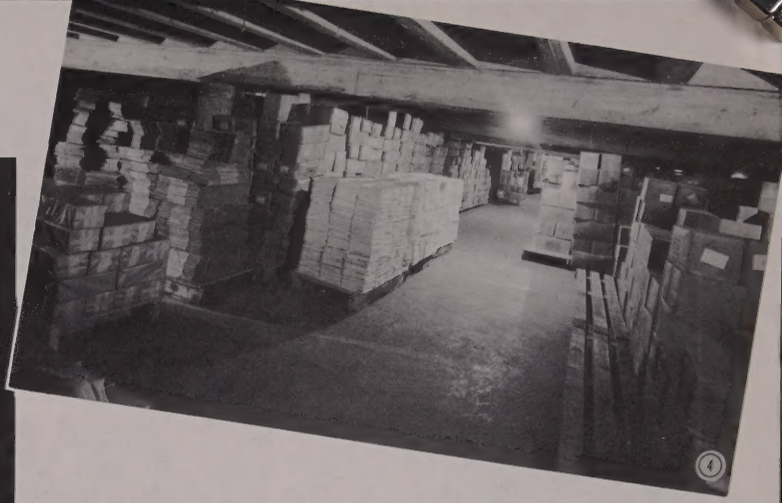
GENERAL ELECTRIC TV Model 810
Photofact Set No. 53, Folder No. 12

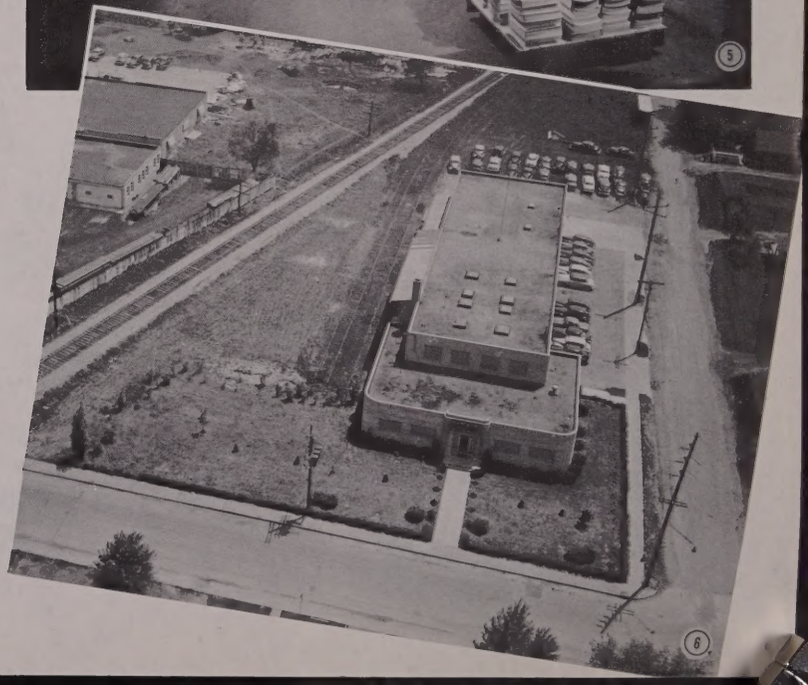
Complaint: Very little control of height.

Cause: C76 in integrating net-work has low resistance short.

Remedy: Replace.

J. W. Smith
1602 West Pratt Street
Baltimore 23, Maryland





1. HERE'S - WHAT - WE - LOOK - LIKE
2. MEET THE GANG - (19 of us had to stay on the job and missed the picture).
3. A PORTION OF OUR ENGINEERING AND ART DEPARTMENT: The general offices are in front of this space -- The shipping department behind it - and - other offices on each side.
4. ONE OF FIVE AISLES IN OUR BASEMENT -- where our raw paper is stocked along with Photofacts and Photofact Publications.
5. ON THE SECOND FLOOR: There are two High-Speed Presses. A new Cutter may be seen - in addition to our gathering and assembly operation. Folding machines and plate making equipment are not shown but are in front of this view.
6. AERIAL VIEWS OF THE PLANT.

KEEP-YOUR-NEW-VOLUMES-NUMBERED

PHOTOFACT CERTIFICATE

This Certificate entitles-you-to a complete set of PHOTOFACT Volume Number Labels (Nos.-11-Thru 20) ABSOLUTELY-FREE --- Fill in your name with your complete mailing address. Tear off Certificate and mail directly to us.

A complete Set of PHOTOFACT Volume Labels (Nos.-11-Thru 20) ABSOLUTELY-FREE with instructions for attaching to binders will be forwarded to you by return mail. (SEE PHOTOFACT SET #62-FOR-CERTIFICATE GOOD-FOR VOLUME-NUMBER LABELS-Nos.-1 Thru 10)

(Please Print)

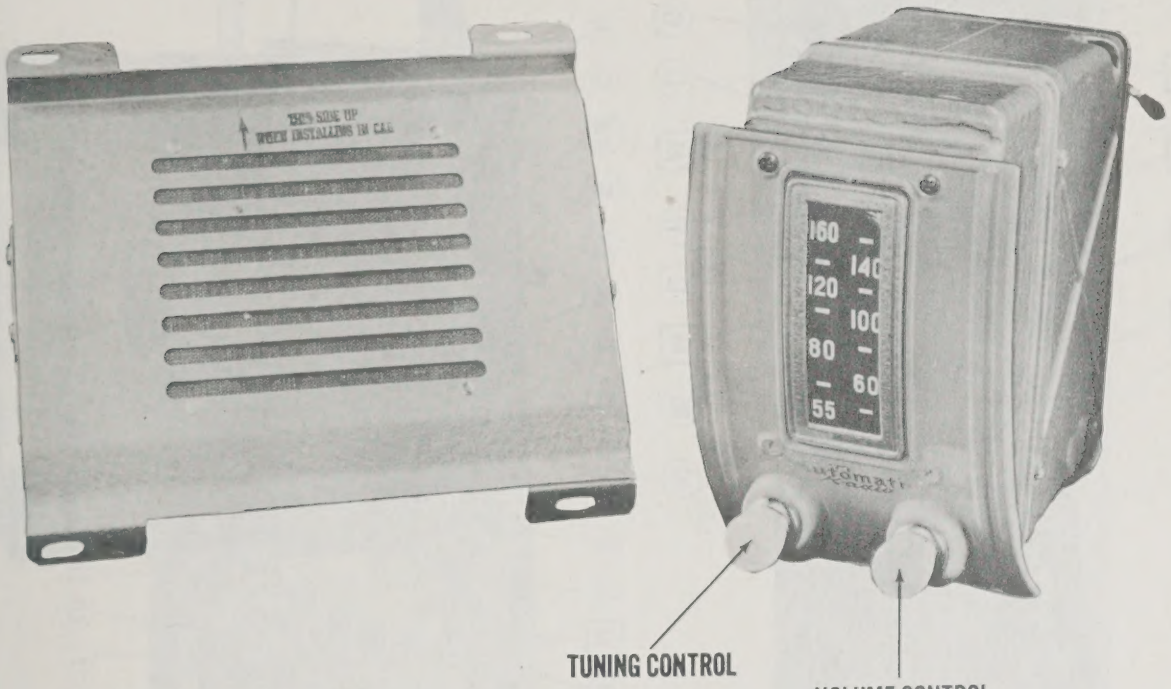
Signed: _____

Street _____ Zone _____

City _____ State _____

MAIL-TO-HOWARD W. SAMS & CO. INC., 2201 E. 46 TH ST. INDIANAPOLIS 5, INDIANA

7. THE "STANDARD NOTATION" SCHEMATIC - and consistent format originate in this Engineering Art Section.
8. CLOSE-UP VIEW OF HIGH-SPEED PRESS EQUIPMENT -- used in producing Photofact Publications.
9. THESE PRECISION FOLDING MACHINES -- assure a uniform production in the continuing Photofact Folder Sets.
10. A SECTION OF THE FORWARD SHIPPING DEPARTMENT -- which speeds Photofact Publications to you.



AUTOMATIC
MODEL C300

AUTOMATIC
MODEL C300

AUTOMATIC MODEL C-300

TRADE NAME	Automatic, Model C-300
MANUFACTURER	Automatic Radio Mfg. Co. Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	Battery Operated Custom Built Automotive Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AT6 DET-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.5 Amp. at 6 Volts DC
TUNING RANGE—BROADCAST	538-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set lower edge of pointer carriage 1 3/8" from top edge of chassis. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BE6 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	100MMF	High side to antenna lead. Low side to chassis.	1600KC	"	"	A5	"
3.	100MMF	"	1400KC	Tune for max. output	"	A6, A7	"
4.	100MMF	"	600KC	"	"	A8, A9 A10	"

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

AUTOMATIC
MODEL C-300

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AUTOMATIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BA6	6BA6	7BK	
V4	DET-AVC-AF	6AT6	6AT6	7BT	
V5	Power Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: AUTOMATIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	350	CE-86	AF64H4A		UP2235C		EL-323	■ Filter
B	20	350							▲ Filter
C	20	25							Output Cathode
C2	.05	200	C207	P285-05		PTE4S5		68P16	AVC Filter
C3	.05	200	C207	P285-05		PTE4S5		68P16	AVC Filter
C4	.05	200	C207	P285-05		PTE4S5		68P16	Decoupling
C5	100		CC200	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Osc. Grid Cap.
C6	.1	400	C210	P488-1		PTE4P1		TM-1	RF Bypass *
C7	.05	200	C207	P285-05		PTE4S5		68P16	Decoupling *
C8	200		CC210	GP200M	D6-201	5W5T2	GP2K-200	1FM-32	Diode RF Filter
C9	.01	600		P485-01	D6-103	PTE6S1	811-01	68P33	Audio Coupling †
C10	200		CC210	GP200M	D6-201	5W5T2	GP2K-200	1FM-32	AF Amp. Grid *
C11	200		CC210	GP200M	D6-201	5W5T2	GP2K-200	1FM-32	AF Amp. Plate
C12	.01	600	C206	P485-01	D6-103	PTE6S1	811-01	68P33	Audio Coupling
C13	.5	100	C209					68P20	Hash Filter
C14	.02	600		P688-02		PTE6S2		TM-12	Output Plate ‡
C15	.008	1600	C205	P1688-0075		PTE16D8		MB-28	Buffer
C16	.5	100	C209					68P20	Hash Filter

* Not used in all models.
† Some models use .002MFD in this application.
‡ Some models use .01MFD in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	750KΩ	½	RV-300	Q13-137			Volume control
B	Sleeve Bushing		Not Req.	S-5 *			Attach to R1A per instructions
C	Switch		Not Req.	76-1			Attach to R1A per instructions.

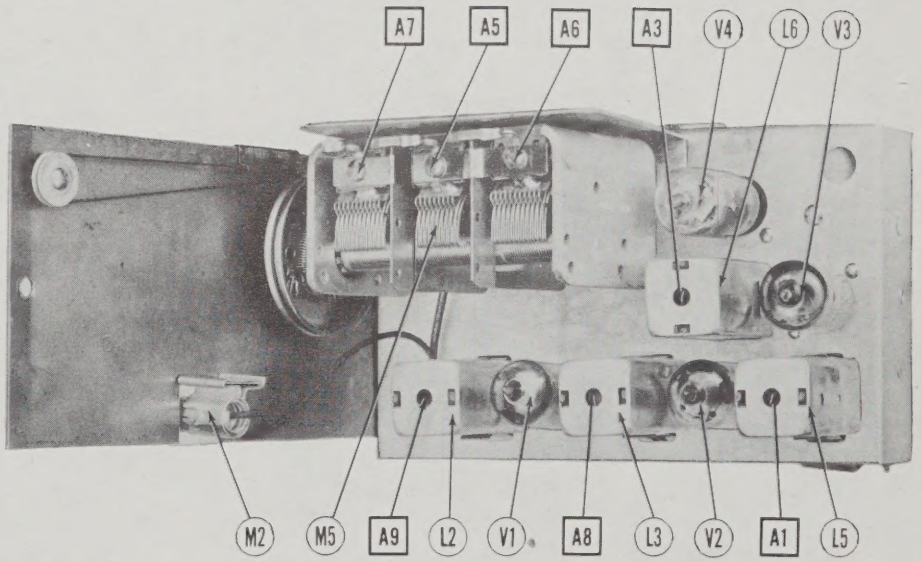
* Cut sleeve bushing to desired length to duplicate original.

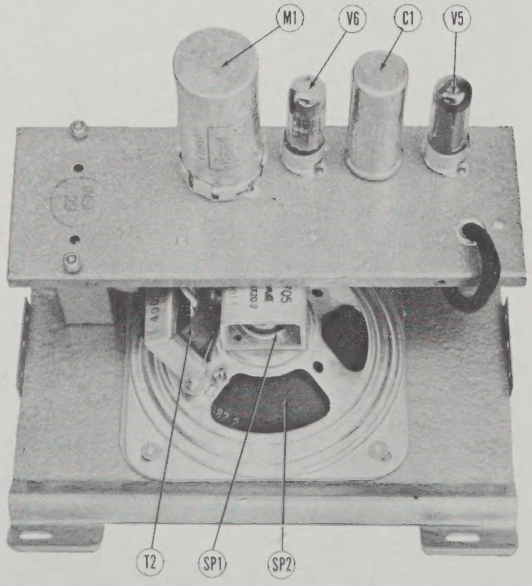
RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	IRC PART No.	IDENTIFICATION CODES
R2	1 Meg.	½	R309	BTS-1 Meg.	AVC Network
R3	20KΩ	½	R306	BTS-22K	Osc. Grid
R4	820Ω	½		BTS-820	IF Amp. Cathode-See Note 1
R5	20KΩ	2	R313	BT-2-22K	Screen Dropping
R6	2 Meg.	½	R310	BTS-2 Meg.	AVC Network
R7	10 Meg.	½	R311	BTS-10 Meg.	AF Amp. Grid
R8	240KΩ	½		BTS-220K	AF Amp. Plate-See Note 2
R9	510KΩ	½	R308	BTS-470K	Output Grid
R10	330Ω	½	R303	BW-½-330	Output Cathode
R11	1000Ω	1	R312	BTA-1000	Filter
R12	100Ω	½	R301	BW-½-100	Hash Suppression
R13	100Ω	½	R301	BW-½-100	Hash Suppression
R14	1000Ω	½		BTS-1000	RF Amp. Cathode-See Note 3

Note 1. Some models use a 1500Ω resistor in this application.
Note 2. Some models use a 250KΩ resistor in this application.
Note 3. Not used in all models.

CHASSIS—TOP VIEW





PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	AUTOMATIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6VDC @ 3A	425VCT .038ADC			TV-100		P-2970	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AUTOMATIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	4800Ω	3.4Ω	400Ω	.7Ω	Part of SP1	A-3877	A-2930	RO-8	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AUTOMATIC PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-105 ①		
SP1	PM	3.4Ω	PM-705	MOD. P5-X	52A21 ①	① Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	5"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AUTOMATIC PART No.	MEISSNER PART No.	
L1	Ant. Loading	2Ω		L200		Includes capacitor used as coil form
L2	Ant. Coil	14.5Ω	5Ω	57FB-3		
L3	RF Coil	90Ω	7.5Ω	57BB-4		
L4	Osc. Coil	10Ω		L201		Tap at 1.2Ω
L5	1st IF	21Ω	21Ω	1655-16		
L6	2nd IF	21Ω	21Ω	1655-16		
L7	Hash Choke	0Ω		L203		
L8	Hash Choke	.2Ω		L202		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				INSTALLATION NOTES
				AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Int.	6VDC	115 ∿	V-83	A-100	C-01	5301	

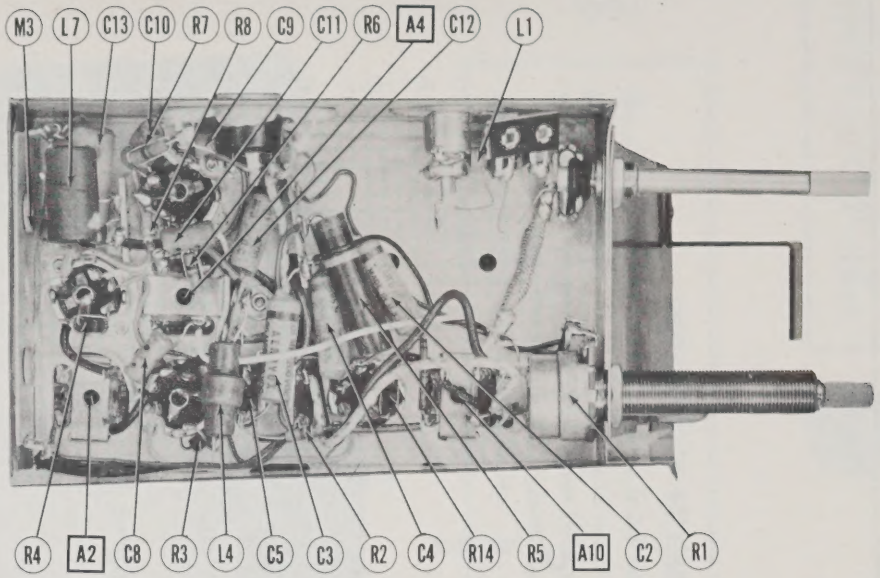
DIAL LIGHTS

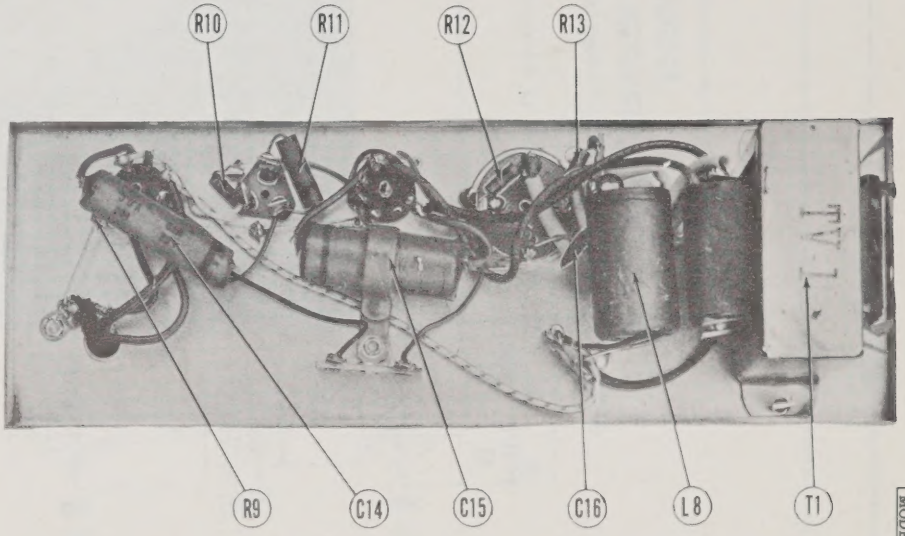
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AUTOMATIC PART No.		
M2	Bayonet	6-8	.15	Brown	T51		Type #47

MISCELLANEOUS

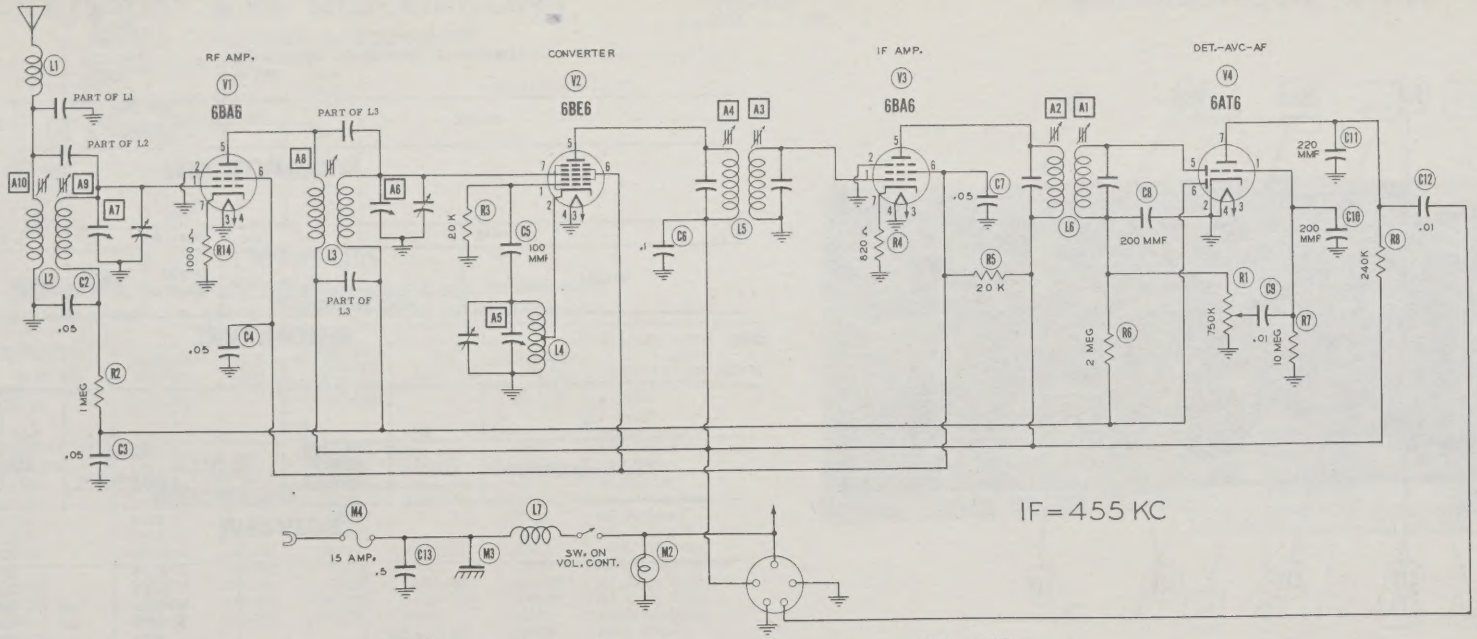
ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M3	Spark Plate	A201	15 Amp.
M4	Fuse	CV-300	(20-402MMF, 16-403MMF, 33-217MMF)
M5	3 Gang Var. Cap.	D300	
	Dial Scale	PS300	
	Dial Pointer	H310	
	Knob		

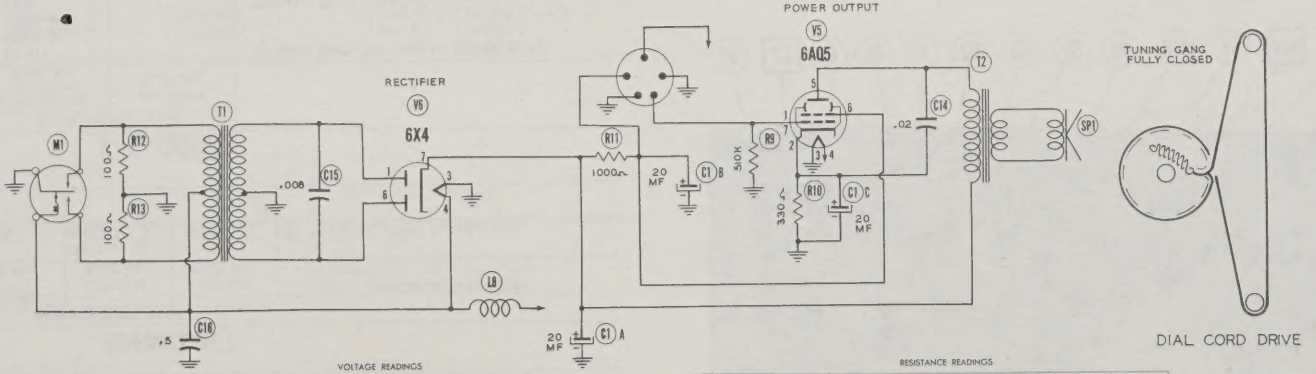
CHASSIS—BOTTOM VIEW





AUTOMATIC MODEL C-300





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	-.1VDC	0V.	0V.	6.3VDC	210VDC	70VDC	2.7VDC
V 2	6BE6	‡-6.5VDC	0V.	6.3VDC	0V.	210VDC	70VDC	-.5VDC
V 3	6BA6	0V.	0V.	6.3VDC	0V.	210VDC	70VDC	2.6VDC
V 4	6AT6	-.6VDC	0V.	6.3VDC	0V.	-.5VDC	-.5VDC	75VDC
V 5	6AQ5	0V.	10VDC	0V.	6.3VDC	220VDC	210VDC	0V.
V 6	6X4	270VAC	0V.	0V.	6.3VDC	0V.	270VAC	240VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	3.7 Meg.	0Ω	0Ω	.1Ω	†1000Ω	†21KΩ	1000Ω
V 2	6BE6	20KΩ	1.2Ω	.1Ω	0Ω	†1000Ω	†21KΩ	2.7 Meg.
V 3	6BA6	22Ω	0Ω	.1Ω	0Ω	†1000Ω	†21KΩ	820Ω
V 4	6AT6	10 Meg.	0Ω	.1Ω	0Ω	750KΩ	2.7 Meg.	†240KΩ
V 5	6AQ5	510KΩ	330Ω	0Ω	.1Ω	†400Ω	†1000Ω	510KΩ
V 6	6X4	380Ω	Inf.	0Ω	.1Ω	Inf.	400Ω	7KΩ

† MEASURED FROM PIN 7 OF V6.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

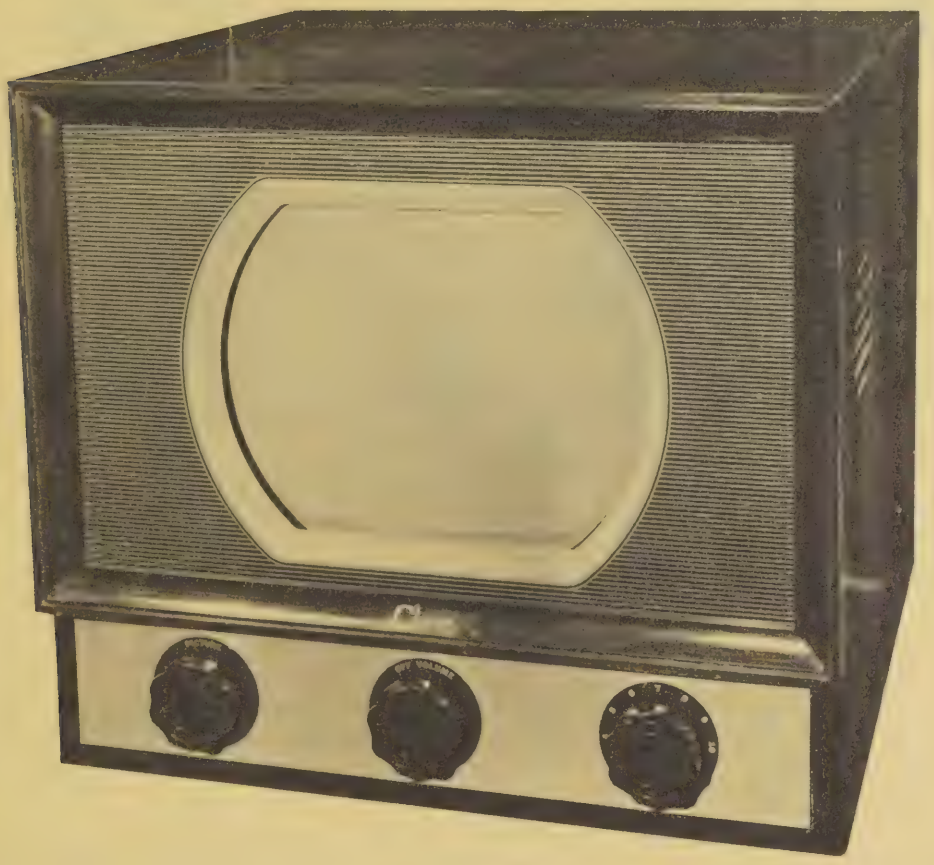
CLARION MODEL

16703

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



CLARION MODEL

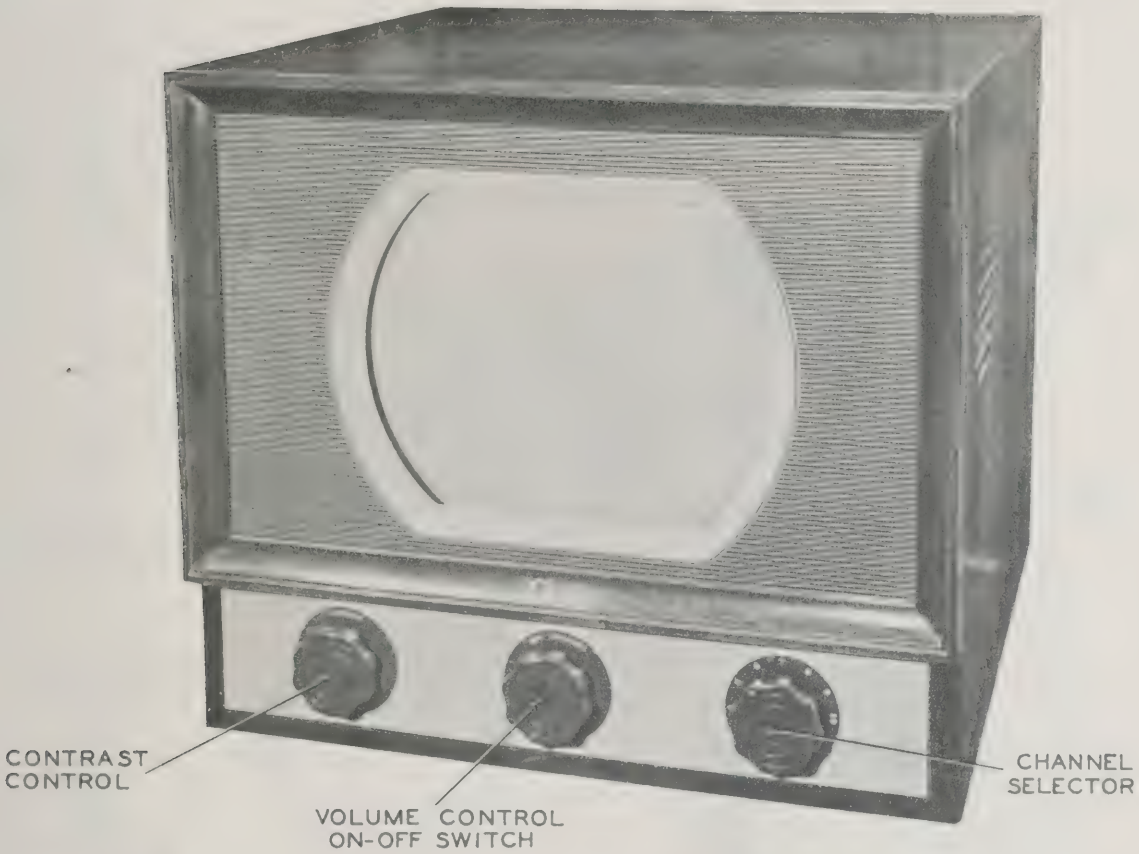
16703

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 7/50 Set No. 102—Folder No. 2

CLARION
MODEL 16703



CLARION
MODEL 16703

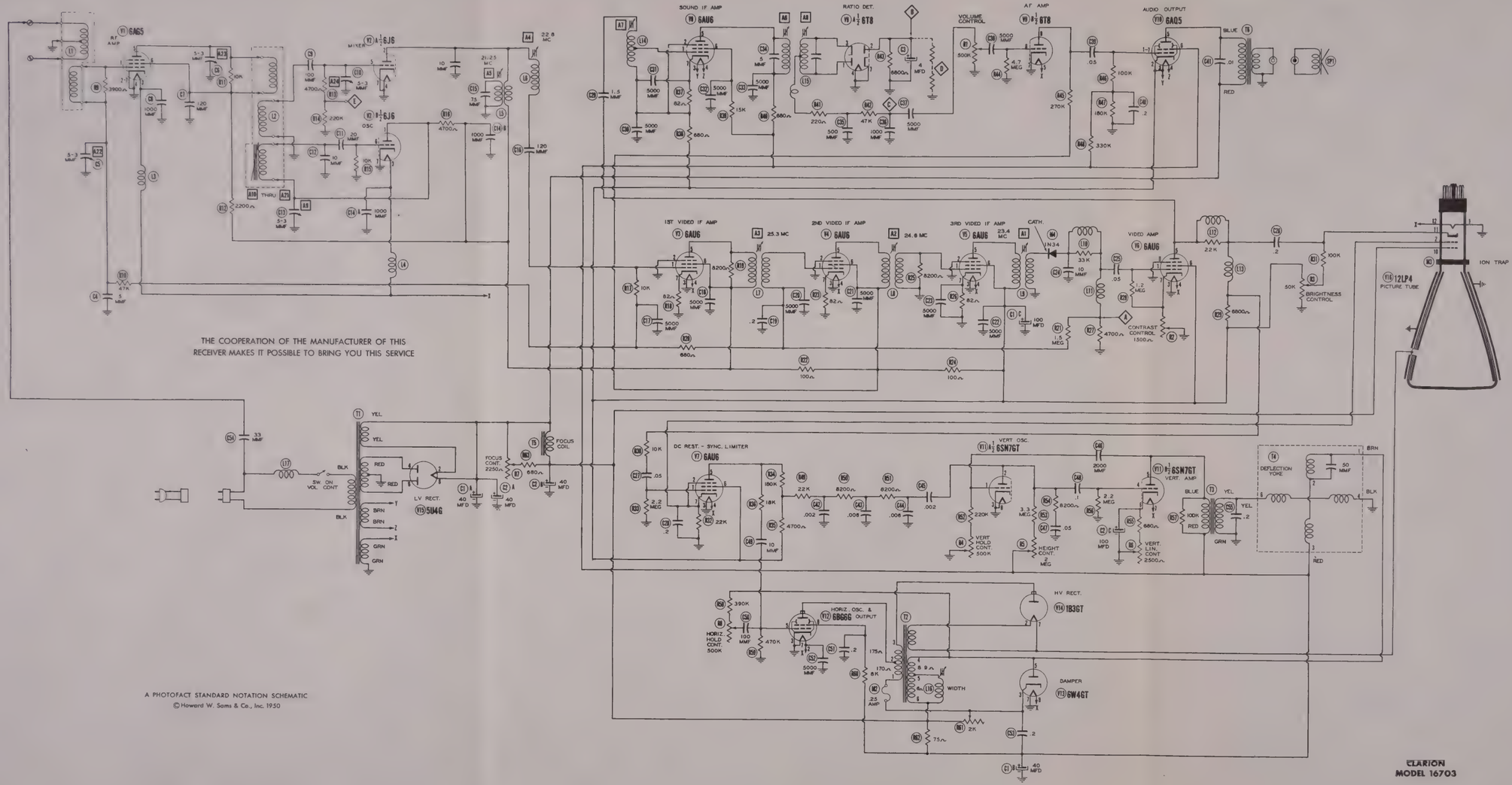
TRADE NAME	Clarion, Model 16703
MANUFACTURER	Warwick Mfg. Corp., 4640 W. Harrison St., Chicago (44), Illinois
TYPE SET	Televison Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.7 Amp. at 117 Volts AC
TUNING RANGE–	Channels 2 thru 13

INDEX

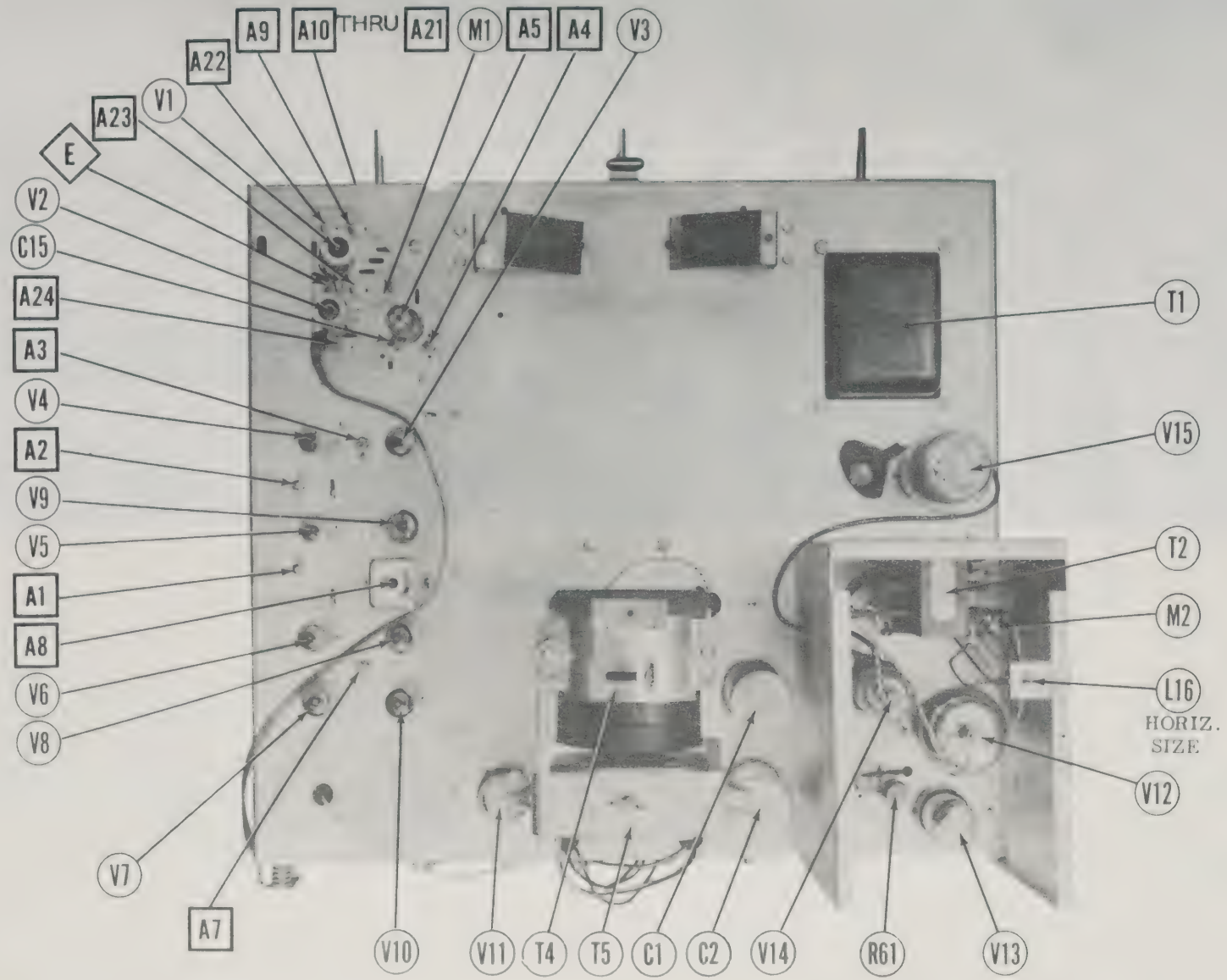
Alignment Instructions 6, 7
Parts List and Description 12, 13
Photographs
Cabinet-Rear View 7
Capacitor Identification 11, 14
Chassis-Top View 3
RF Tuner 10
Photographs (continued)
Resistor Identification 15, 16
Trans., Inductor and Alignment Identification 4, 9
Schematic 2
Tube Placement Chart 5
Voltage and Resistance Measurements 8

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

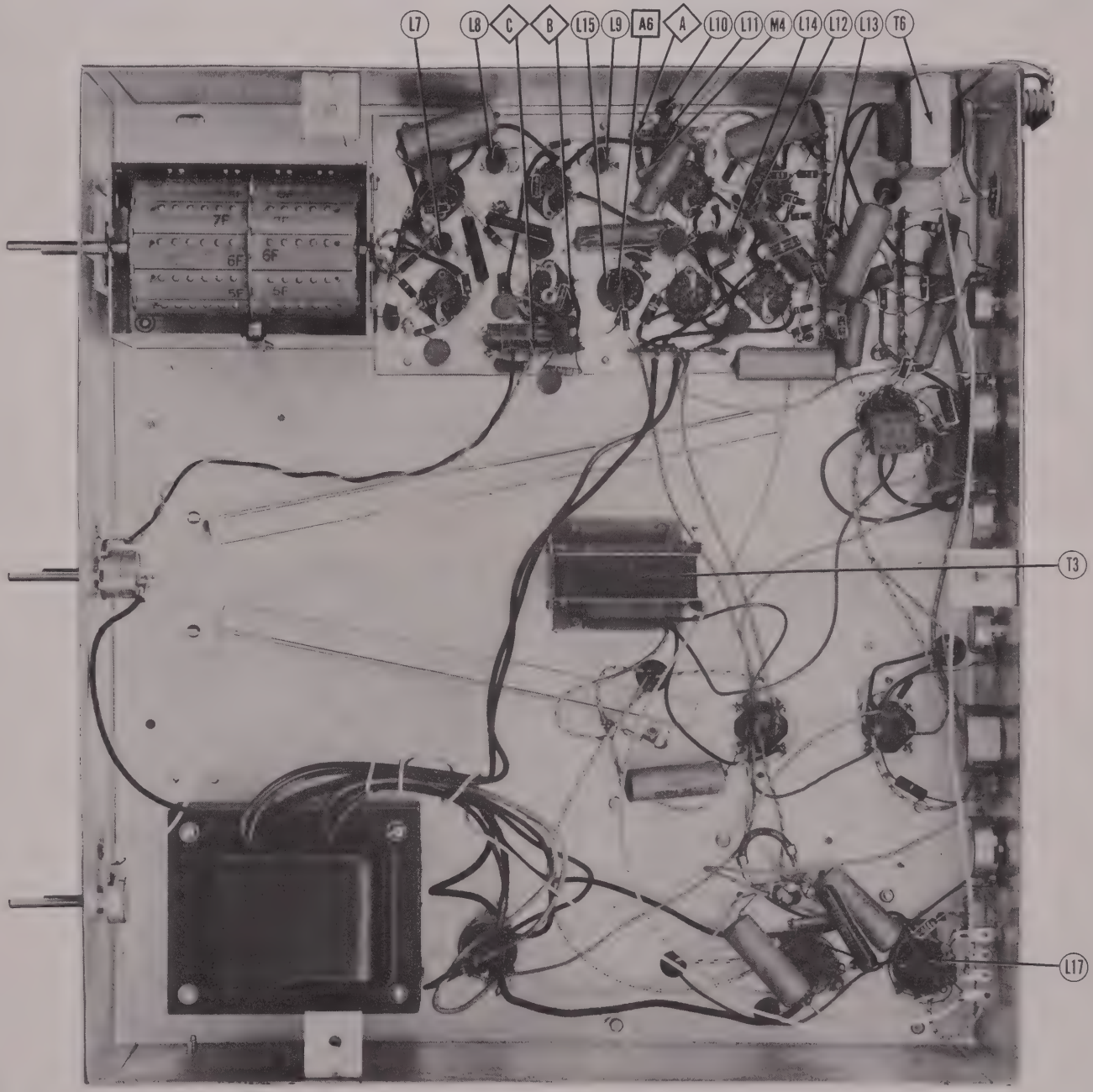
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



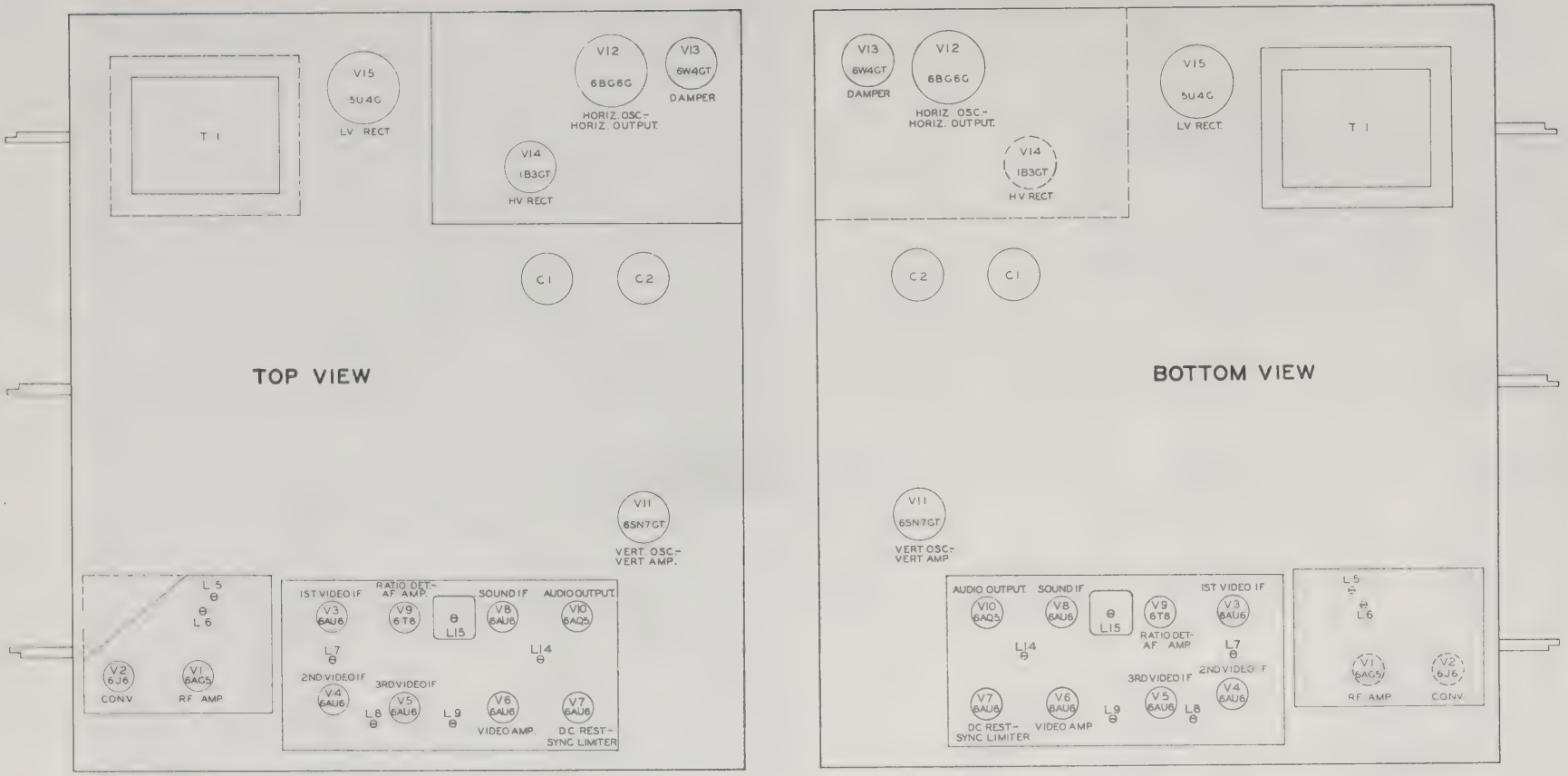
CLARION
MODEL 16703



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and dressed away from chassis.

VIDEO IF ALIGNMENT

Remove converter tube (V2) from its socket, and replace with a 6J6 which has had pin 1 removed to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	23.4MC (10MC SWP)	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	24.5MC	"	"	A2	"
3.	Direct	"	25.3MC	"	"	A3	"
4.	Direct	"	22.8MC	"	"	A4	"
5.	Direct	"	21.25MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC SWP)	21.25MC 25.75MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve as shown in figure 1. If necessary slightly retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from point B to chassis. The junction of these two resistors is alignment point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (B). Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	.01MFD	"	"	"	DC Probe to Point (C). Common to Point (D).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C3. Adjust for maximum amplitude and symmetry as per figure 2.
10.	.01MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A8	Reconnect capcitor C3. Adjust A8 to place 4.5MC at center of crossover lines per Fig 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove dummy converter tube and replace with original 6J6 in its socket.
The overall oscillator circuit adjustment (A9) should be adjusted only in case any individual channel oscillator adjustment shows insufficient range.
If A9 is adjusted ALL channels will require realignment.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω resistor in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A10	Adjust to place sound marker in "notch" as shown in figure 4. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A11	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A12	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A13	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A14	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A15	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A16	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A17	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A18	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A19	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A20	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A21	

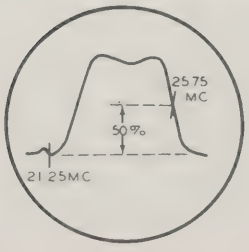


FIG. 1

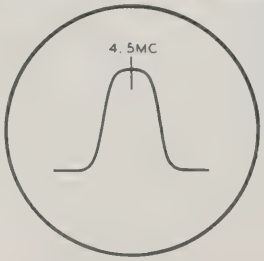


FIG. 2

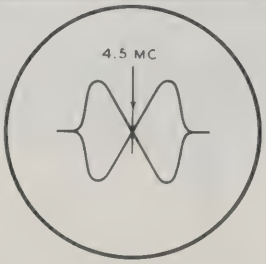


FIG. 3

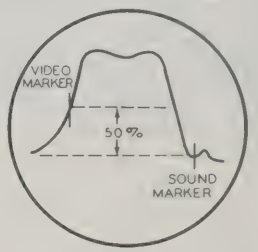


FIG. 4

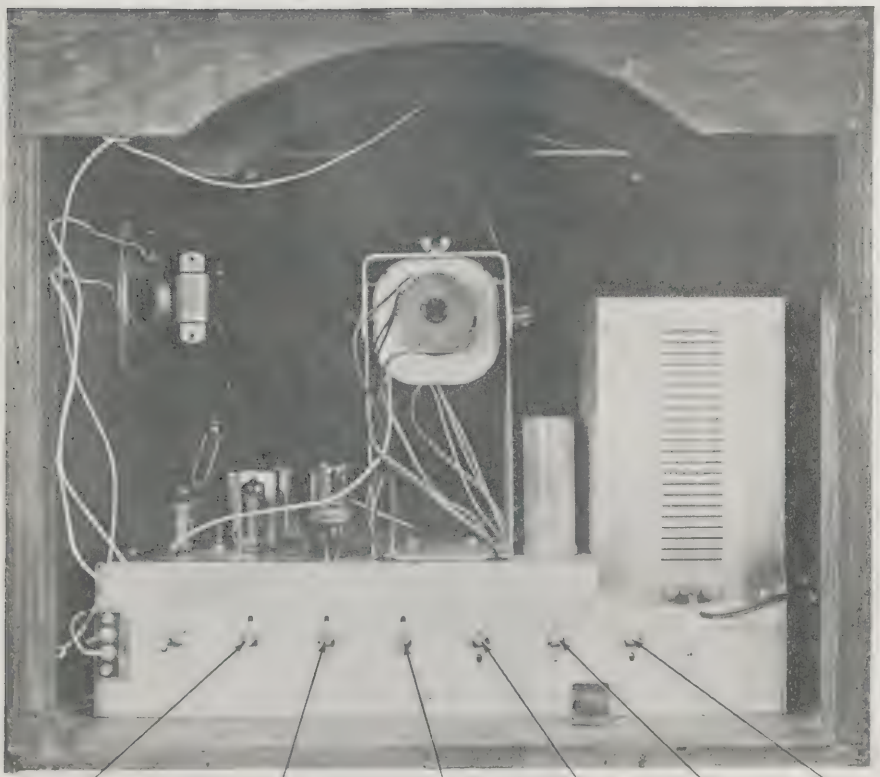
ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. to Point E thru 10KΩ. Low side to chassis.	A22, A23, A24	Adjust for response curve similar to figure 5 with markers above 80%.
13.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check for response curve similar to figure 5. If markers fall below 70% on any channel make slight adjustment of A22, A23 and A24 with channel selector switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

FIG. 5



CABINET-REAR VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.2VDC	0V.	6.3VAC	0V.	105VDC	105VDC	0V.		
V 2	6J6	80VDC	125VDC	6.3VAC	0V.	-.9VDC	§-3.5VDC	0V.		
V 3	6AU6	-.1VDC	0V.	0V.	6.3VAC	125VDC	125VDC	.7VDC		
V 4	6AU6	-.1VDC	0V.	0V.	6.3VAC	125VDC	125VDC	.5VDC		
V 5	6AU6	0V.	0V.	0V.	6.3VAC	130VDC	130VDC	.8VDC		
V 6	6AU6	.4VDC	0V.	0V.	6.3VAC	90VDC	130VDC	15VDC		
V 7	6AU6	-.1VDC	4.4VDC	0V.	6.3VAC	115VDC	130VDC	5VDC		
V 8	6AU6	▲8.6VDC	▲8.6VDC	▲0V.	▲6.3VAC	▲215VDC	▲145VDC	▲10VDC		
V 9	6T8	-.1VDC	-.8VDC	-.4VDC	0V.	6.3VAC	0V.	0V.	-.3VDC	55VDC
V 10	6AQ5	▲-7.4VDC	▲0V.	▲0V.	▲6.3VAC	▲240VDC	▲220VDC	▲-7.4VDC		
V 11	6SN7GT	-30VDC	65VDC	0V.	.2VDC	360VDC	14VDC	6.3VAC	0V.	
V 12	6BG6G	120VDC	6.3VAC	0V.	370VDC	-.2VDC	320VDC	0V.	230VDC	TOP CAP *
V 13	6W4GT	0V.	0V.	430VDC	430VDC	370VDC	0V.	0V.	6.3VAC	
V 14	1B3GT	* DO NOT MEASURE.								
V 15	5U4G	0V.	400VDC	0V.	380VAC	0V.	380VAC	0V.	400VDC	
V 16	12LP4	0V.	5VDC	PIN 10 360VDC	PIN 11 0V. 130VDC	PIN 12 6.3VAC				

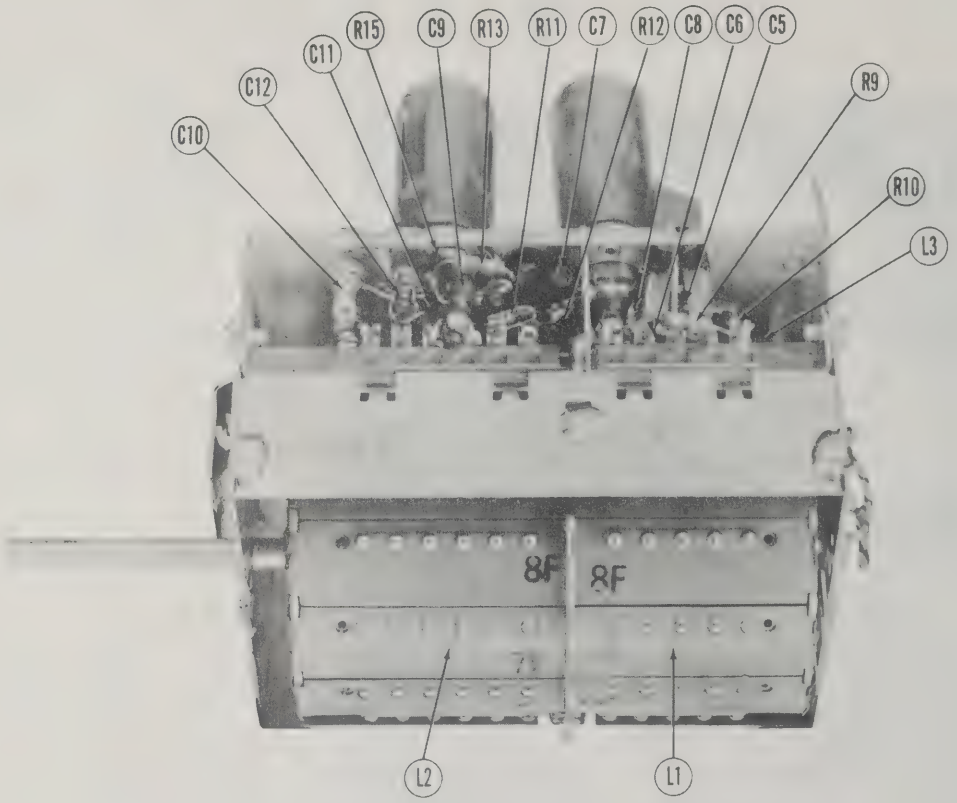
§ TAKEN WITH VACUUM TUBE VOLTMETER.
▲ MEASURED FROM PIN 2 OF V10.

RESISTANCE READINGS

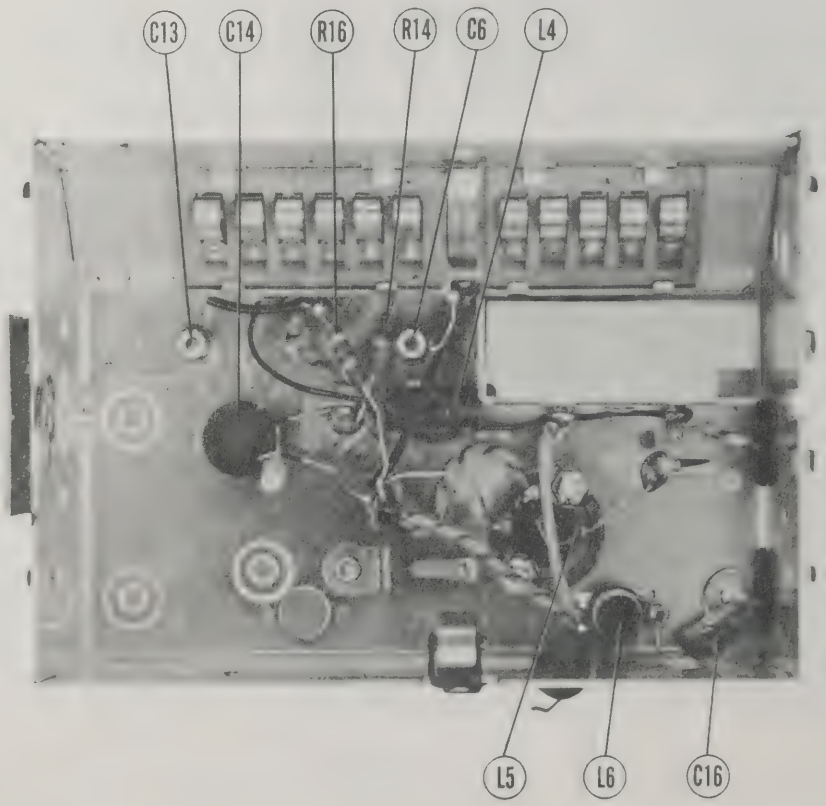
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1.5 Meg.	0Ω	.1Ω	0Ω	▲2.4KΩ	▲2.4KΩ	0Ω		
V 2	6J6	▲5KΩ	▲200Ω	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	1.5 Meg.	0Ω	0Ω	.1Ω	▲200Ω	▲200Ω	82Ω		
V 4	6AU6	1.5 Meg.	0Ω	0Ω	.1Ω	▲100Ω	▲100Ω	82Ω		
V 5	6AU6	.2Ω	0Ω	0Ω	.1Ω	▲.2Ω	▲0Ω	82Ω		
V 6	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	▲6.8KΩ	▲0Ω	1.5KΩ		
V 7	6AU6	2.2 Meg.	22KΩ	0Ω	.1Ω	▲185KΩ	▲0Ω	22KΩ		
V 8	6AU6	▲680Ω	▲680Ω	▲0Ω	▲.1Ω	†960Ω	†15KΩ	▲700Ω		
V 9	6T8	Inf.	6.8KΩ	Inf.	0Ω	.1Ω	Inf.	0Ω	4.7 Meg.	▲270KΩ
V 10	6AQ5	†250KΩ	▲0Ω	▲0Ω	.1Ω	†385Ω	†300Ω	†250KΩ		
V 11	6SN7GT	220KΩ 720KΩ	†3.2 Meg. †5.2Meg.	0Ω	2.2 Meg.	†900Ω	3KΩ 680Ω	.1Ω	0Ω	
V 12	6BG6G	0Ω	.1Ω	0Ω	†250Ω	470KΩ	†400KΩ †900KΩ	0Ω	†8KΩ	TOP CAP †1.8KΩ
V 13	6W4GT	Inf.	Inf.	†1.5KΩ	†1.5KΩ	†200Ω	Inf.	0Ω	.1Ω	
V 14	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †2KΩ
V 15	5U4G	Inf.	150KΩ	Inf.	46Ω	Inf.	46Ω	Inf.	150KΩ	
V 16	12LP4	0Ω	22KΩ	PIN 10 †200Ω	PIN 11 150KΩ 100KΩ	PIN 12 .1Ω				

▲ MEASURED FROM PIN 2 OF V10.
† MEASURED FROM PIN 8 OF V15.

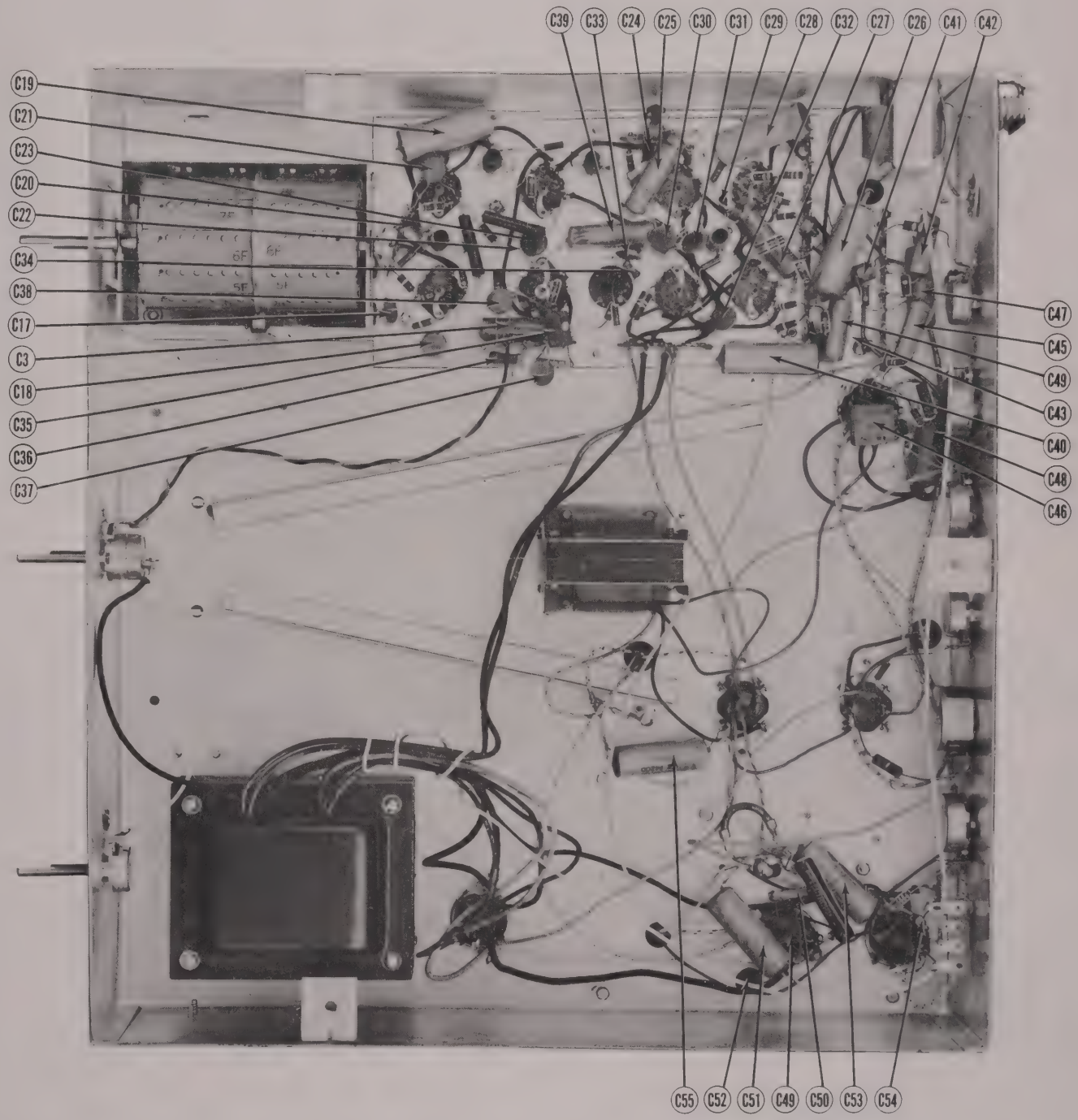
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.		6AG5	7BD	
V2	Converter		6J6	7BF	
V3	1st Video IF		6AU6	7BK	
V4	2nd Video IF		6AU6	7BK	
V5	3rd Video IF		6AU6	7BK	
V6	Video Amp.		6AU6	7BK	
V7	DC Rest.-Sync. Limiter		6AU6	7BK	
V8	Sound IF Amp.		6AU6	7BK	
V9	Ratio Det.-AF Amp.		6T8	9E	
V10	Audio Output		6AQ5	7BQ	
V11	Vert. Osc.-Vert. Amp.		6SN7GT	8BD	
V12	Hor. Osc.-Hor. Output		6BG6G	5BT	
V13	Damper		6W4GT	4CG	
V14	HV Rect.		1B3GT	3C	
V15	LV Rect.		5U4G	5T	
V16	Picture Tube		12LP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AF88J20E		UP13CJ		TVL-306	▲ Filter
B	40	450				1192			■ Filter
C	100	200							▲ Decoupling
C2A	40	450		AF88J20E		UP13CJ		TVL-308	▲ Filter
B	40	450				1192			■ Filter
C	100	200							▲ Vert. Output Cath. Byp.
C3	4	50		PR8150/4		BR550		TVA-13	Stabilizing Cap.
C4	5			SI5DNPO	D2-4.7		NPOK-5		Fixed Trimmer *
C5	.5-3				829-3				Variable Trimmer
C6	.5-3				829-3				Variable Trimmer
C7	120			GP130K	D6-121		GP2K-120		RF Decoupling
C8	1000			GP1000M	D6-102		GP2L-001		RF Fil. Byp.
C9	100			SI100KN750	DN-100		N750L-100		RF Coupling
C10	.5-3				829-3				Variable Trimmer
C11	20			SI20KNPO	D2-20		NPOK-20		Osc. Grid Cap.
C12	10			SI10DN750	DN-10		N750K-10		Fixed Trimmer
C13	.5-3				829-3				Variable Trimmer
C14A	1000			GP1000M	D6-102		882-2 x 0015	29C7	Osc. Fil. Byp.
B	1000			GP1000M	D6-102				RF Bypass
C15	75			CN75JNPO	D2-75		NPOM-75		Fixed Trimmer
C16	120	300		GP120K	D6-121		GP2K-120		IF Coupling
C17	5000			BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C18	5000			BPD-5	D6-502	1D5D5	811-005	29C1	1st V. IF Decoupling
C19	.2	400		P488-22		GT4P2		TC-2	AGC Filter
C20	5000			BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C21	5000			BPD-5	D6-502	1D5D5	811-005	29C1	2nd V. IF Decoup.
C22	5000			BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C23	5000			BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Cath. Byp.
C24	10			GP10K	D6-100	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C25	.05	400		P488-05		PTE4S5		TM-15	Video Coupling
C26	.2	400		P488-22		GT4P2		TC-2	Video Coupling
C27	.05	400		P488-05		PTE4S5		TM-15	Video Coupling
C28	.2	400		P488-22		GT4P2		TC-2	Sync. Limiter-DC Rest. Cath. Byp.
C29	1.5			CI1.5CNPO	D2-1.5		NPOK-1.5		S. IF Coupling
C30	5000			BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Decoupling
C31	5000			BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Cath. Byp.
C32	5000			BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Screen Byp.
C33	5000			BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Plate Dec.
C34	5			SI5DNPO	D2-4.7	5R5V5	NPOK-5	MS-55	Fixed Trimmer
C35	500	500		1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Diode Load Cap.
C36	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	De-emphasis
C37	5000			BPD-5	D6-502	1D5D5	811-005	29C1	Audio Coupling
C38	5000			BPD-5	D6-502	1D5D5	811-005	29C1	Audio Coupling
C39	.05	400		P488-05		PTE4S5		TM-15	Audio Coupling
C40	.2	400		P488-22		GT4P2		TC-2	Bias Filter
C41	.01	600		P688-01	D6-103	PTE6S1	811-01	TM-11	Output Plate Byp.
C42	.002	600		P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Integrator Net.
C43	.006	600		P688-006	D6-562	PTE6D6		TM-26	Integrator Net.
C44	.006	600		P688-006	D6-562	PTE6D6		TM-26	Integrator Net.
C45	.002	600		P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Vert. Sync. Coupling
C46	2000	800							Vert. Feedback
C47	.05	600		P688-05		PTE6S5		TM-15	Vert. Discharge
C48	.1	600		P688-1		PTE6P1		TM-1	Vert. Sweep Coupling
C49	10			GP10K	D6-100	5W5Q1	GP1K-10	1FM-41	Hor. Sync. Coupling
C50	100			CN100JN030	D2-100	5R5T1	NPOM-100	MS-31	Hor. Feedback
C51	.2	400		P488-22		GT4P2		TC-2	Hor. Output Screen Byp.
C52	5000			BPD-5	D6-502	1D5D5	811-005	29C1	Hor. Output Fil. Byp.
C53	.2	400		P488-22		GT4P2		TC-2	Hor. Sweep Coup.
C54	33			GP33K	D6-330	5W5Q4	GP1K-33	1FM-44	Ant. Coupling
C55	.2	400		P488-22		GT4P2		TC-2	Fixed Trimmer

* Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	24-184	QI1-133	M-60-Z	B-60-S	Volume control
B	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A per instructions
R2	1500Ω	½	25-12				Contrast control
R3A	50KΩ	½	25-10	QI1-123	M-44-S	AN-31	Brightness control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R3A per instructions
R4A	500KΩ	½	25-11	QI1-133	M-58-S	AN-59	Vert. hold control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R4A per instructions
R5A	2 Meg.	½	25-15	QI1-139	M-83-S	AN-75	Height control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R5A per instructions
R6A	2500Ω	½	25-13	QI1-112	M-15-S	AN-7	Vert. linearity control
B	Shaft		Not Req.	Not Req.	Not. Req.	AK-1	Attach to R6A per instructions
R7	2250Ω	2	25-14	W-3000	43-2500	V-131	Focus control-Wire Wound
R8A	500KΩ	½	25-11	QI1-133	M-58-S	AN-59	Horiz. hold control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R8A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R9	3900Ω	½		BTS-3900	Ant. Coil Shunt
R10	47KΩ 20%	½		BTS-47K	AGC Network
R11	10KΩ	½		BTS-10K	RF Plate Coil Shunt
R12	2200Ω 20%	½		BTS-2200	RF Decoupling
R13	4700Ω	½		BTS-4700	Conv. Grid
R14	220KΩ 20%	½		BTS-220K	Conv. Grid
R15	10KΩ	½		BTS-100K	Osc. Grid
R16	4700Ω	½		BTS-4700	Osc. Plate
R17	10KΩ 20%	½			1st Video IF Grid
R18	82Ω	½			1st Video IF Cathode
R19	8200Ω 5%	½			2nd Video IF Transformer Shunt
R20	680Ω 20%	½		BTS-680	AGC Network
R21	1.5 Meg. 20%	½		BTS-1.5 Meg.	AGC Network
R22	100Ω	1		BW-1-100	Decoupling-Wire Wound
R23	82Ω	½			2nd Video IF Cathode
R24	100Ω	1		BW-1-100	Decoupling-Wire Wound
R25	8200Ω 5%	½			3rd Video IF Transformer Shunt
R26	82Ω	½			3rd Video IF Cathode
R27	4700Ω	½		BTS-4700	Video Det. Load
R28	1.2 Meg.	½		BTS-1.2 Meg.	Video Amp. Grid
R29	6800Ω	1		BTA-6800	Video Amp. Plate
R30	10KΩ	½		BTS-10K	Isolation
R31	100KΩ	½		BTS-100K	Voltage Divider
R32	22KΩ	½		BTS-22K	Picture Tube Grid
R33	2.2 Meg. 20%	½		BTS-2.2 Meg.	Sync. Limiter Grid
R34	180KΩ	½		BTS-180K	Sync. Limiter Plate
R35	4700Ω	½		BTS-4700	Sync. Limiter Plate
R36	18KΩ	½		BTS-18K	Isolation
R37	82Ω	½			Sound IF Cathode
R38	680Ω 20%	½		BTS-680	Voltage Divider
R39	15KΩ	1			Sound IF Screen
R40	680Ω 20%	½		BTS-680	Sound IF Plate Decoupling
R41	220Ω	½			Balancing
R42	47KΩ	½		BTS-47K	De-emphasis
R43	6800Ω	½		BTS-6800	Ratio Det. Diode Load
R44	4.7 Meg.	½		BTS-4.7 Meg.	AF Amp. Grid
R45	270KΩ 20%	½		BTS-270K	AF Amp. Plate
R46	100KΩ 20%	½		BTS-100K	Output Grid
R47	180KΩ 5%	½		BTS-180K-5%	Voltage Divider
R48	330KΩ 5%	½		BTS-330K-5%	Voltage Divider
R49	22KΩ	½		BTS-22K	Integrator Network
R50	8200Ω 5%	½		BTS-8200-5%	Integrator Network
R51	8200Ω 5%	½		BTS-8200-5%	Integrator Network
R52	220KΩ	½		BTS-220K	Vert. Osc. Grid
R53	3.3 Meg. 20%	½		BTS-3.3 Meg.	Vert. Osc. Plate
R54	8200Ω 5%	½		BTS-8200-5%	Vert. Peaking
R55	680Ω 20%	½		BTS-680	Vert. Amp. Cathode
R56	2.2 Meg. 20%	1		BTA-2.2 Meg.	Vert. Amp. Grid
R57	100KΩ	½		BTS-100K	Vert. Output Transformer Shunt
R58	390KΩ	½		BTS-390K	Feedback
R59	470KΩ 20%	½		BTS-470K	Horiz. Output Grid
R60	8000Ω	10		AB-8000	Horiz. Output Screen-Wire Wound
R61	2000Ω	20		DHA-2000	Damper Filter-Adjustable-Wire Wound
R62	75Ω	1			Filter-Wire Wound-See Note
R63	680Ω	1		BTA-680	Focus Coil Shunt

Note. Some models use 68Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.7A	740VCT .200ADC	5VAC @ 3A	6.3VAC @ .72A SEC. 4 6.3VAC @ 6A		P-8153 ①	P-2955 ① P-2944 ③	TP-355 ①

① Drill new mounting holes.
③ Use for SEC. 3

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	345Ω Tap @ 170Ω	9.5Ω Tap @ .6Ω SEC. 2		A-8128	HVO-3	TFB-2	Hor. Output Trans.
T3	590Ω	0Ω 6.8Ω		A-8116	A-3035 ①	TSO-1 ①	Vert. Output Trans.
T4A	10Ω			DY-1	MD-1		Hor. Deflection Coil
B	65Ω						Vert. Deflection Coil
T5	263Ω			FC-10	MF-1		Focus Coil

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T6	6KΩ	4.4Ω	365Ω	.6Ω		A-3877 ②	A-3019	RO-9	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	4.4Ω		ST-110 MOD. P6-V	6A15	
	CONE DIA.	V. C. DIA.				
SP2	5 7/8"	9/16"				

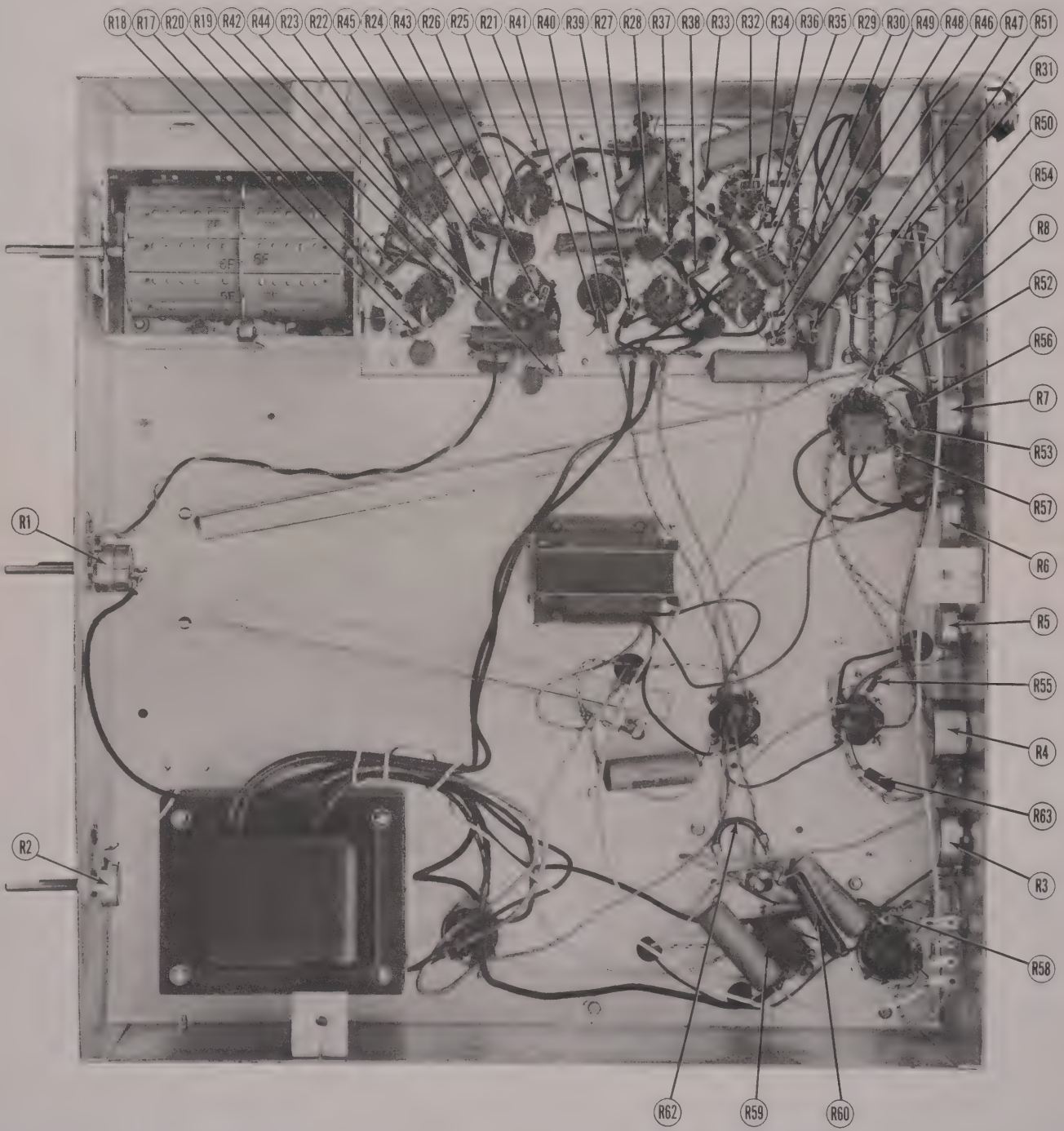
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: MEISSNER PART No.	NOTES
L1	Ant. Coil	0Ω				
L2	RF, Mixer Grid & Osc.					
L3	Fil. Choke	0Ω				
L4	Fil. Choke	0Ω				
L5	Sound Trap	2Ω	0Ω			
L6	1st Video IF	1.5Ω				
L7	2nd Video IF	.2Ω	.2Ω			
L8	3rd Video IF	.2Ω	.2Ω			
L9	4th Video IF	.2Ω	.2Ω			
L10	Peaking	10Ω			19-1921 †	170 microhenries Wound on 33KΩ resistor
L11	Peaking	16.5Ω			19-1923	400 microhenries
L12	Peaking	13.2Ω			19-1922 *	280 microhenries Wound on 33KΩ resistor
L13	Peaking	17Ω			19-1923	400 microhenries
L14	Sound IF	11.8Ω				Tap at 7.9Ω
L15	Ratio Det. Trans.	4.2Ω	.2Ω			
L16	Horiz. Size	.3Ω				
L17	Ant. Chk.	.1Ω				

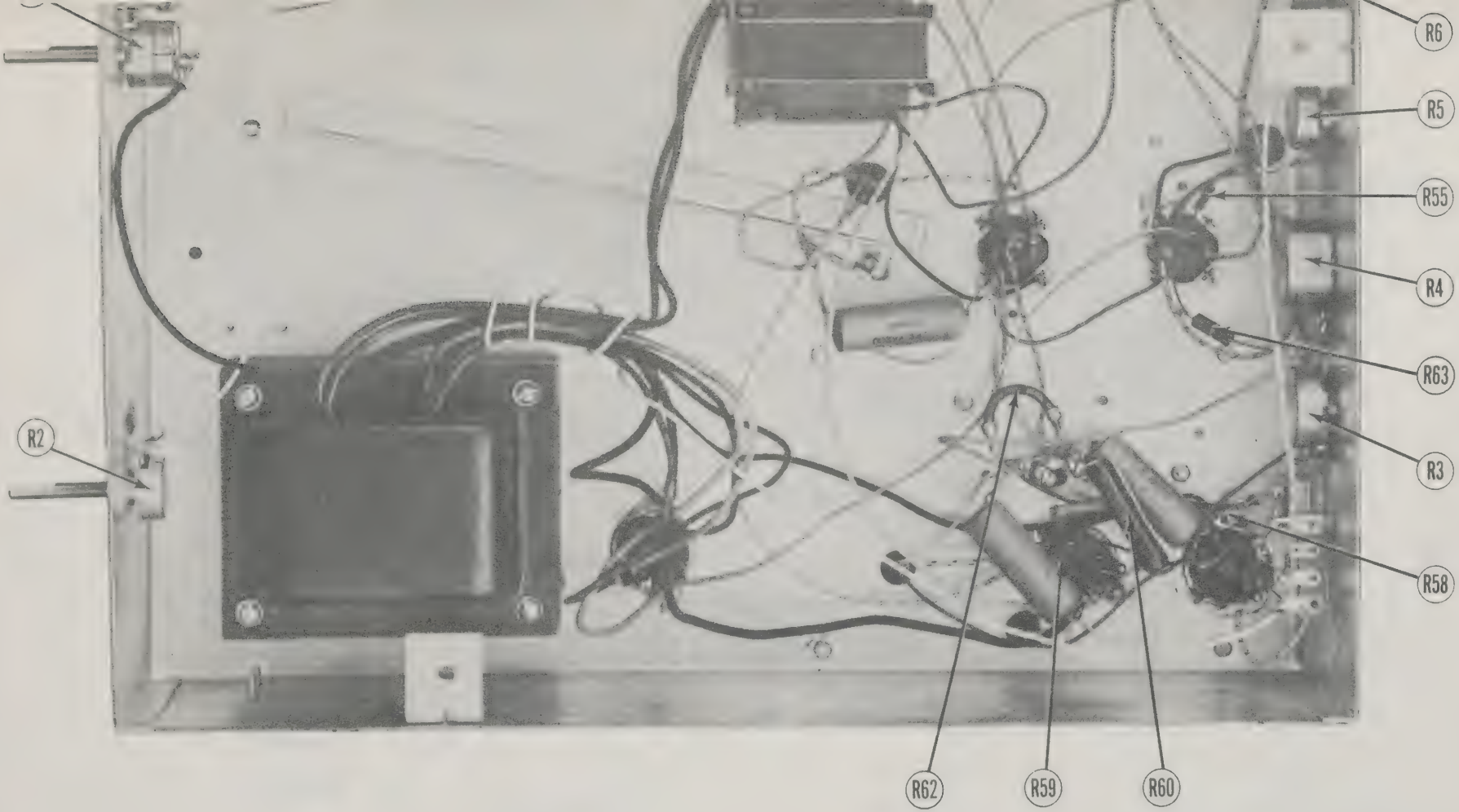
† Parallel with 33KΩ resistor
* Parallel with 23KΩ resistor

MISCELLANEOUS

ITEM No.	PART NAME	CLARION PART No.	NOTES
M1	RF Tuner		
M2	Fuse		.25A 250V Type 3AG
M3	Ion Trap		
M4	Crystal		1N34 Video Detector



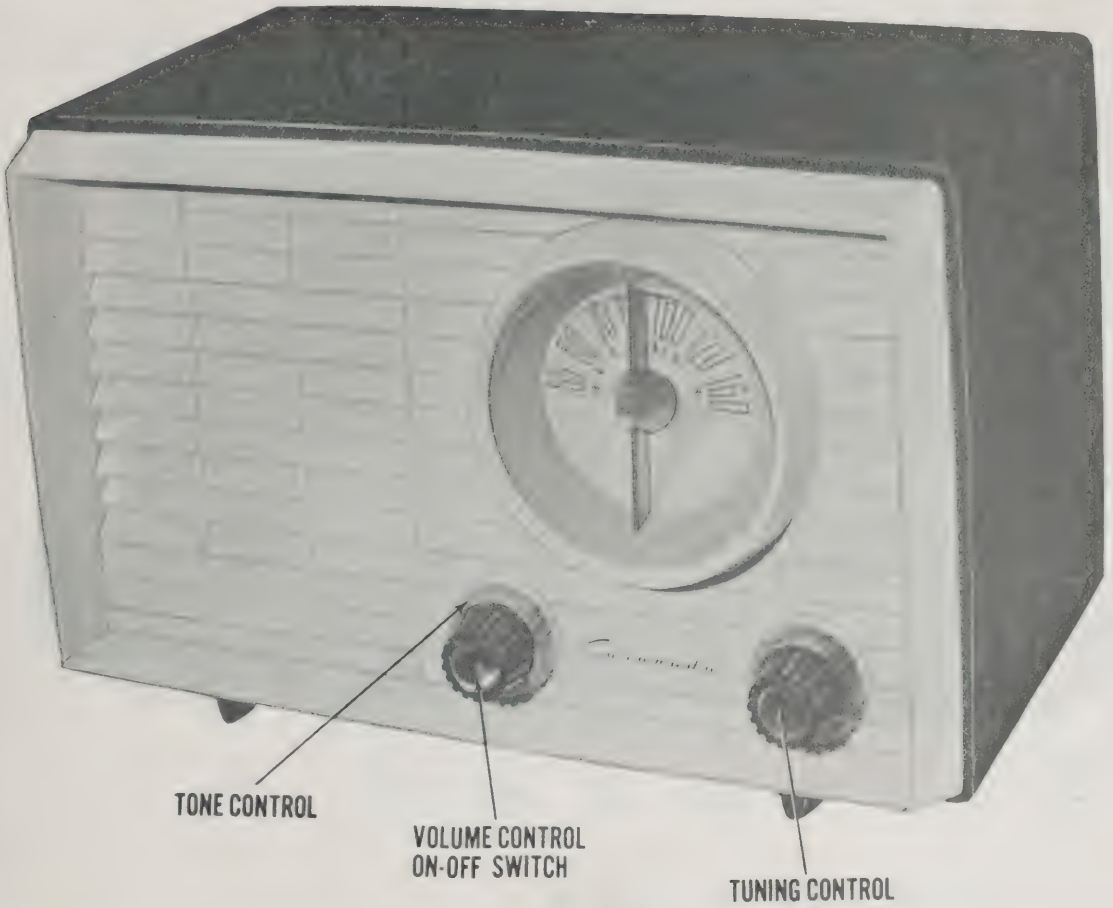
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CORONADO
MODEL 05RA37-43-8360A

CORONADO
MODEL 05RA37-43-8360A



CORONADO
MODEL 05RA37-43-8360A

CORONADO MODEL 05RA37-43-8360A

TRADE NAME	Coronado, Model 05RA37-43-8360A
SUPPLIER	Gamble-Skogmo Inc., 15 N. 8th St., Minneapolis, Minn.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types 12BA6 RF Amp., 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 35C5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .24 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 12BE6 (V2). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.1MFD	"	1600KC	1600KC	"	A5	Adjust for maximum output.
3.		Loop	1500KC	Tune for max. output	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		Loop	"	"	"	A7	"

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

CORONADO
MODEL 05RA37-43-8360A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amp.	12BA6	12BA6	7BK	
V4	DET-AVC-AF	12AT6	12AT6	7BT	
V5	Power Output	35C5	35C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	150	508147	PRSA150/30-		EDL3215		TA-230	Filter-Red
B	20	150		20					Filter-Blue
C2	.02	400	512016	P488-02		PTE4S2		TM-12	AVC Filter
C3	.02	400	512016	P488-02		PTE4S2		TM-12	AVC Filter
C4	15		513405	SI15KNPO	D2-15		NPOK-15	MS-415	Fixed Trimmer
C5	150		512503	GP150M	D6-151	5W5T15	GP2K-150	1FM-315	Osc. Grid Cap-See Note
C6	150		512503	GP150M	D6-151	5W5T15	GP2K-150	1FM-315	Diode RF Filter-See Note
C7	150		512503	GP150M	D6-151	5W5T15	GP2K-150	1FM-315	Diode RF Filter-See Note
C8	.002	600	512002	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Audio Coupling
C9	.002	600	512002	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Tone Compensation
C10A	250		†	GP250M	D6-251	5W5T25	GP2K-250	1FM-325	AF Amp. Plate
B	5000			BPD-5	D6-502	PTE6D5	811-005	TM-25	Audio Coupling
C11	.005	600	512006	P688-005	D6-502	PTE6D5	811-005	TM-25	Output Plate Bypass
C12	.15	400	512040	P488-15		GT4P2		72P53	Line Isolation
C13	.05	600	512030	P688-05		PTE6S5		TM-15	Rect. Plate Bypass

† Items C10A, C10B, R10A and R10B are combined into one unit obtainable under MFGR'S Part No. 505858.
Note. Some models use 100MMF in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	508583	B11-137 *		SBB-642-S	Tone control-front
B	1 Meg.	½		B13-137 *			Volume control-rear
C	Shaft End	½		E-202 *			Attach per instr. in "concentrikit".
D	Switch	½		76-1 *			Attach per instr. in "concentrikit".

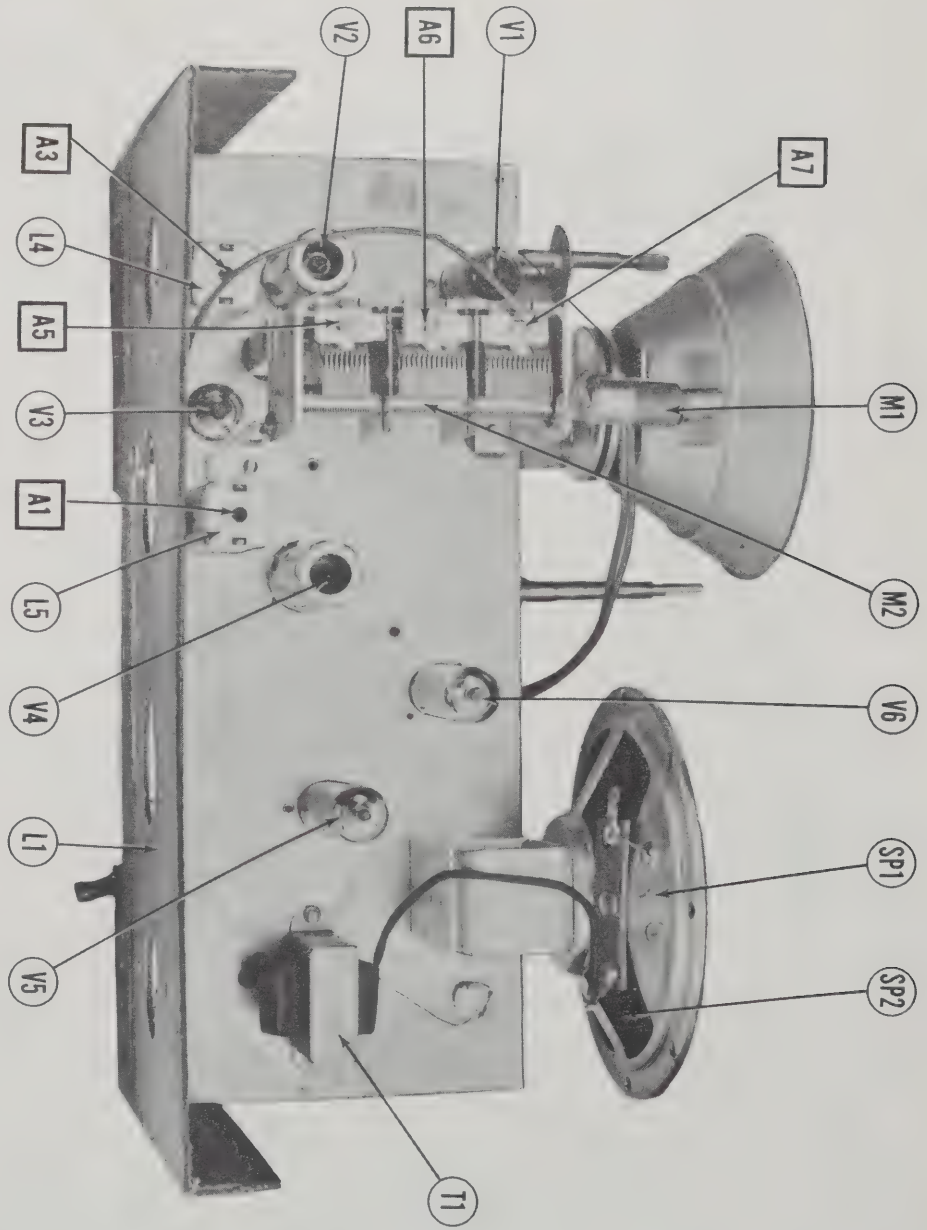
* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CORONADO PART No.	IRC PART No.	IDENTIFICATION CODES
R2	220Ω	½	510125	BW-½-220	RF Amp. Cathode
R3	470KΩ	½	510185	BTS-470K	AVC Network
R4	22KΩ	½	510161	BTS-22K	Osc. Grid
R5	150Ω	½	510121	BW-½-150	IF Amp. Cathode
R6	1 Meg.	½	510131	BTS-1 Meg.	AVC Network
R7	33KΩ	½	510164	BTS-33K	Diode Filter
R8	220KΩ	½	510179	BTS-220K	Isolation
R9	10 Meg.	½	510197	BTS-10 Meg.	AF Amp. Grid
R10A	470KΩ	½	†	BTS-470K	AF Amp. Plate
B	470KΩ	½		BTS-470K	Output Grid
R11	150Ω	½	510121	BW-½-150	Output Cathode
R12	1500Ω	1	510240	BTA-1500	Filter
R13	33Ω	1	510210		Rect. Ballast
R14	390Ω	½	510129	BW-½-390	Dial Lamp Shunt

† Items R10A, R10B, C10A, and C10B are combined into one unit obtainable under MFGR'S Part No. 505858.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		CORONADO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2200Ω	3.3Ω	220Ω	.7Ω	508146	A-3332	A-3025	RO-2 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			CORONADO PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-105		
SP1	PM	3.3Ω	508699	MOD. P5-X	5A15	
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"	9/16"				

DIAL LIGHTS

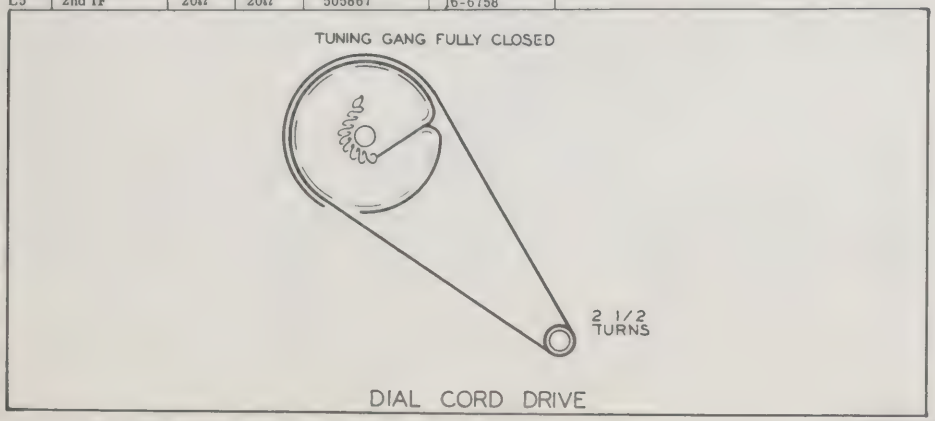
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					CORONADO PART No.		
M1	Bayonet	6-8	.15	Brown	118921		Type #47

MISCELLANEOUS

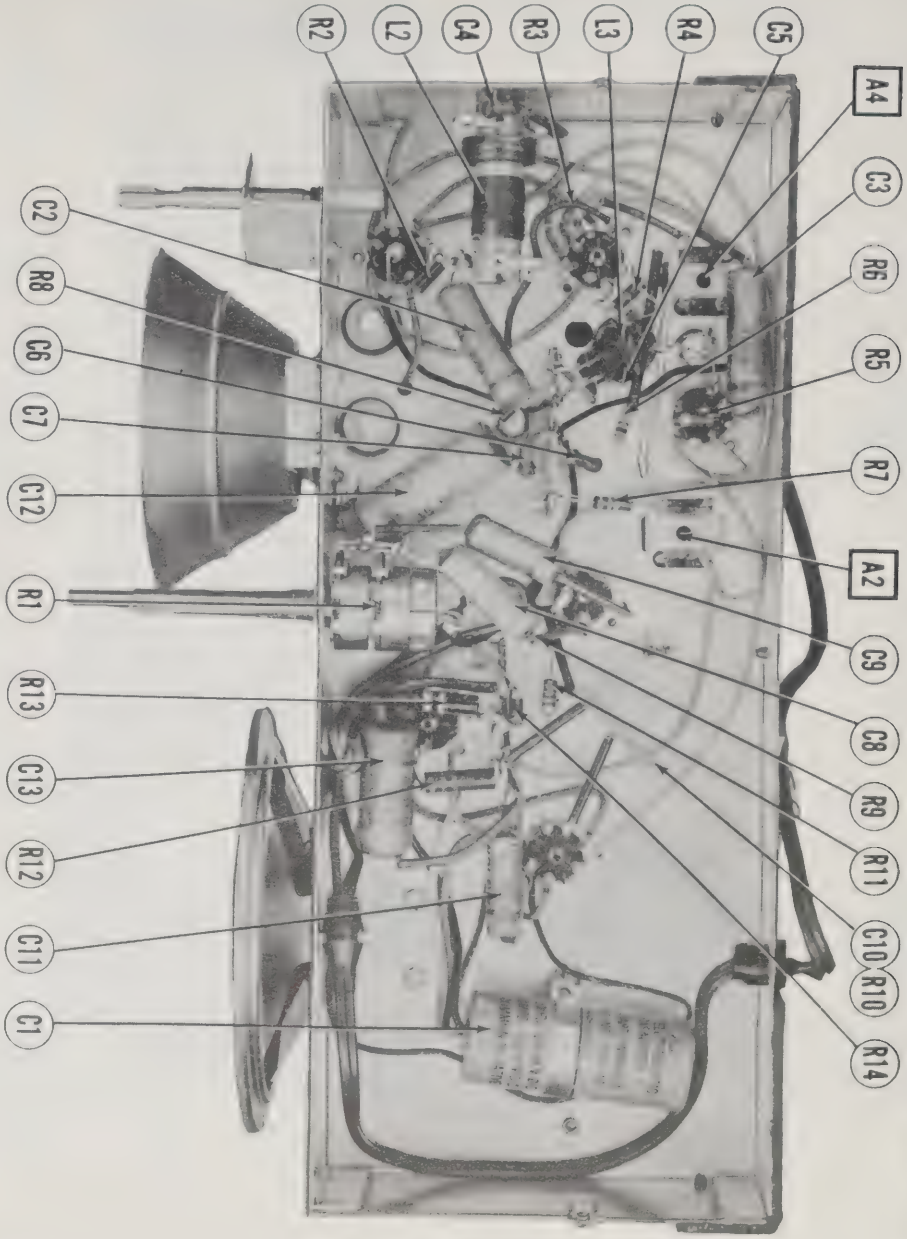
ITEM No.	PART NAME	CORONADO PART No.	NOTES
M2	3 Gang Var. Cap.	508584	(30-499MMF, 36-503MMF, 33-228MMF)
	Dial Scale	508690	
	Dial Pointer	508653	
	Cabinet	508759	
	Knob	508628	Tone
	Knob	508602	Tuning
	Knob	508629	Volume-On

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	CORONADO PART No.	MEISSNER PART No.
L1	Loop Ant.	3.2Ω		508740	
L2	RF Coil	105Ω	5.5Ω	508692	14-1072
L3	Osc. Coil	.5Ω	3.2Ω	506094	14-1073
L4	1st IF	20Ω	20Ω	505867	16-6758
L5	2nd IF	20Ω	20Ω	505867	16-6758



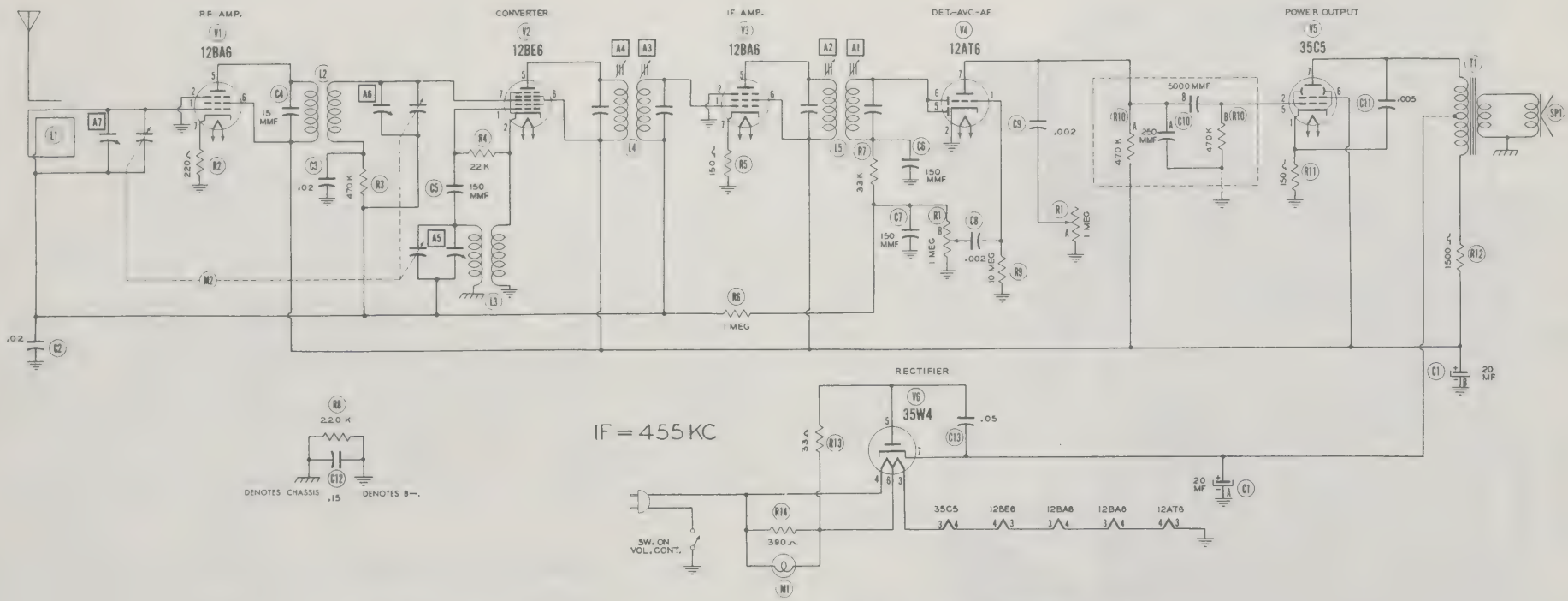
CHASSIS—BOTTOM VIEW



SET 102 FOLDER 3

CORONADO MODEL 05RA37-43-8360A

CORONADO MODEL 05RA37-43-8360A



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	-.4VDC	0V.	38VAC	25.5VAC	80VDC	80VDC	1.2VDC
V 2	12BE6	-5.6VDC	0V	38VAC	51VAC	80VDC	80VDC	-.3VDC
V 3	12BA6	-.2VDC	0V	25.5VAC	13VAC	80VDC	80VDC	1.1VDC
V 4	12AT6	-.6VDC	0V	0V	13VAC	-.4VDC	-.4VDC	35VDC
V 5	35C5	4.2VDC	0V.	85VAC	51VAC	0V.	80VDC	110VDC
V 6	35W4	115VDC	0V.	85VAC	117VAC	110VAC	114VAC	115VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	2 Meg.	0Ω	36Ω	24Ω	11.5KΩ	11.5KΩ	220Ω
V 2	12BE6	22KΩ	.5Ω	36Ω	48Ω	11.5KΩ	11.5KΩ	2.5 Meg.
V 3	12BA6	2 Meg.	0Ω	24Ω	13Ω	11.5KΩ	11.5KΩ	150Ω
V 4	12AT6	10 Meg.	0Ω	0Ω	13Ω	1 Meg.	1 Meg.	†470KΩ
V 5	35C5	150Ω	470KΩ	80Ω	48Ω	470KΩ	11.5KΩ	†200Ω
V 6	35W4	†1Ω	Inf.	80Ω	110Ω	138Ω	105Ω	400KΩ

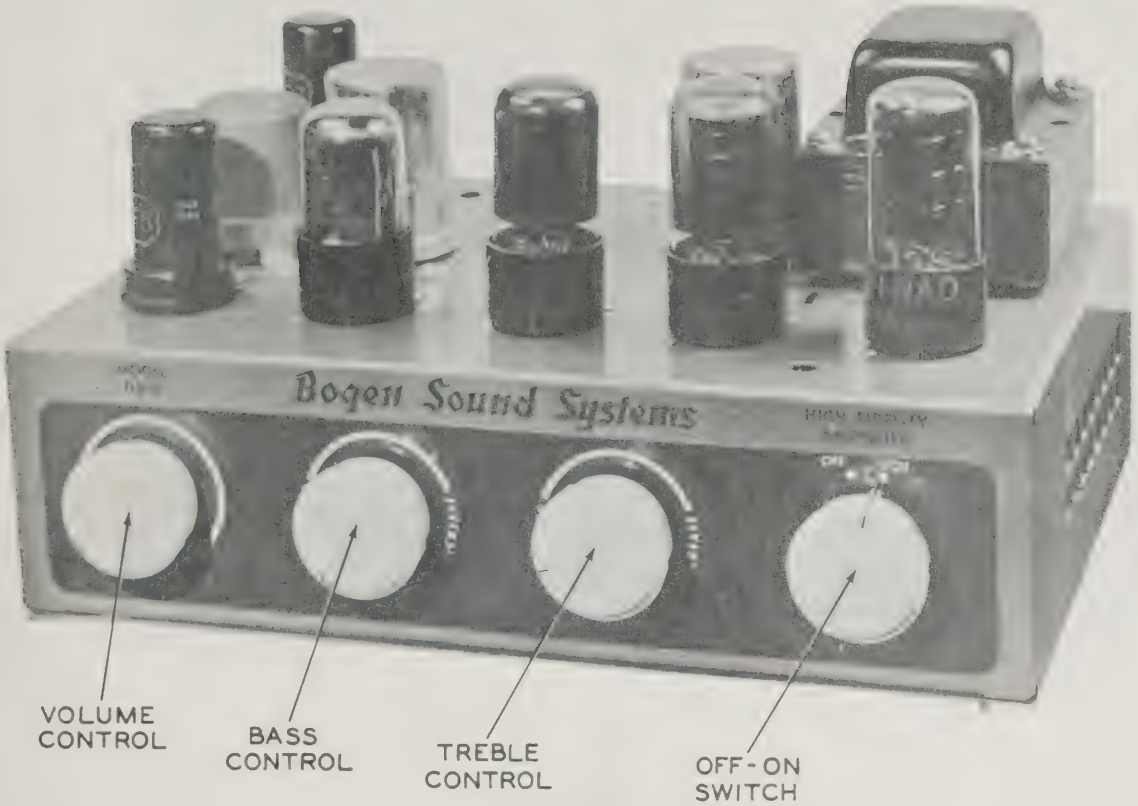
† MEASURED FROM PIN 7 OF V6.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DAVID BOGEN
MODEL DB-10



DAVID BOGEN
MODEL DB-10

DAVID BOGEN MODEL DB-10

TRADE NAME	David Bogen, Model DB-10
MANUFACTURER	David Bogen Co. Inc., 663 Broadway, New York 12, New York
TYPE SET	AC Operated 3 Channel Audio Amplifier
TUBES (SIX)	Types 6SC7 Pre-Amp., 6SF5 1st AF Amp., 6SL7GT 2nd AF Amp., (2) 6V6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .6 Amp. at 117 Volts AC

CONNECTIONS

INPUT --- Three input connections are available. The connector marked "AMPLIFIER INPUT" is used with crystal phonograph pickups. It may also be used as a connection for a radio tuner. The radio output can be taken from the detector or from the voice coil leads. If both a radio and phonograph (crystal pickup) are to be used, connect a single pole, double throw switch so that one may select between the radio and phonograph. The connector marked "LOW MAGNETIC" is used with a low output magnetic phonograph pickup. The connector marked "HIGH MAGNETIC" is used with high output magnetic phonograph pickup. When either the high or low magnetic connectors are used, the PREAMP OUTPUT and AMPLIFIER INPUT connectors must be connected together by means of the short shielded lead supplied with the amplifier.

OUTPUT --- Impedance taps of 4, 8, and 16 ohms ate provided to match the impedance of the speaker voice coil used with the unit.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

DAVID BOGEN
MODEL DB-10

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DAVID BOGEN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Pre.-Amp.	6SC7	6SC7	8S	
V2	1st AF Amp.	6SF5	6SF5	6AB	
V3	2nd AF Amp,	6SL7GT	6SL7GT	8BD	
V4	Power Output	6V6GT	6V6GT	7AC	
V5	Power Output	6V6GT	6V6GT	7AC	
V6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DAVID BOGEN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	10	450		AF2222J *		UP5Q45 *		EL-410 *	▲ Filter
B	10	450							▲ Filter
C2A	5	450		AF2222J		UP5Q45		EL-410	▲ Decoupling
B	5	450							■ Decoupling
C	5	450							▲ Decoupling
D	5	450							Decoupling
C3	50	50		PRS50/50		BR505		TVA-16	Output Cath. Byp.
C4	.05	400		P488-05		PTE4S5		TM-15	Audio Coupling
C5	.05	400		P488-05		PTE4S5		TM-15	Audio Coupling
C6	.05	400.		P488-05		PTE4S5		TM-15	Audio Coupling
C7	.01	600		P688-01	D6-103	PTE6S1	811-01	TM-11	Tone Compensation
C8	.02	600		P688-02		PTE6S2		TM-12	Audio Coupling
C9	.25	200		P488-25		GT2P25		TC-2	Tone Compensation
C10	.25	200		P488-25		GT2P25		TC-2	Tone Compensation
C11	.002	600		P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Tone Compensation
C12	.05	400		P488-05		PTE4S5		TM-15	Audio Coupling
C13	.05	400		P488-05		PTE4S5		TM-15	Audio Coupling
C14	.05	400		P488-05		PTE4S5		TM-15	Audio Coupling
C15	25	500		1468-000025	D6-250	5W5Q25	GP1K-25	MS-425	AF Feedback
C16	.001	600		P688-001	D6-102	PTE6D1	GP2L-001	TM-21	Output Plate Bypass
C17	.1	400		P488-1		PTE4P1		TM-1	Line Filter

* Parallel sections to obtain desired capacity.

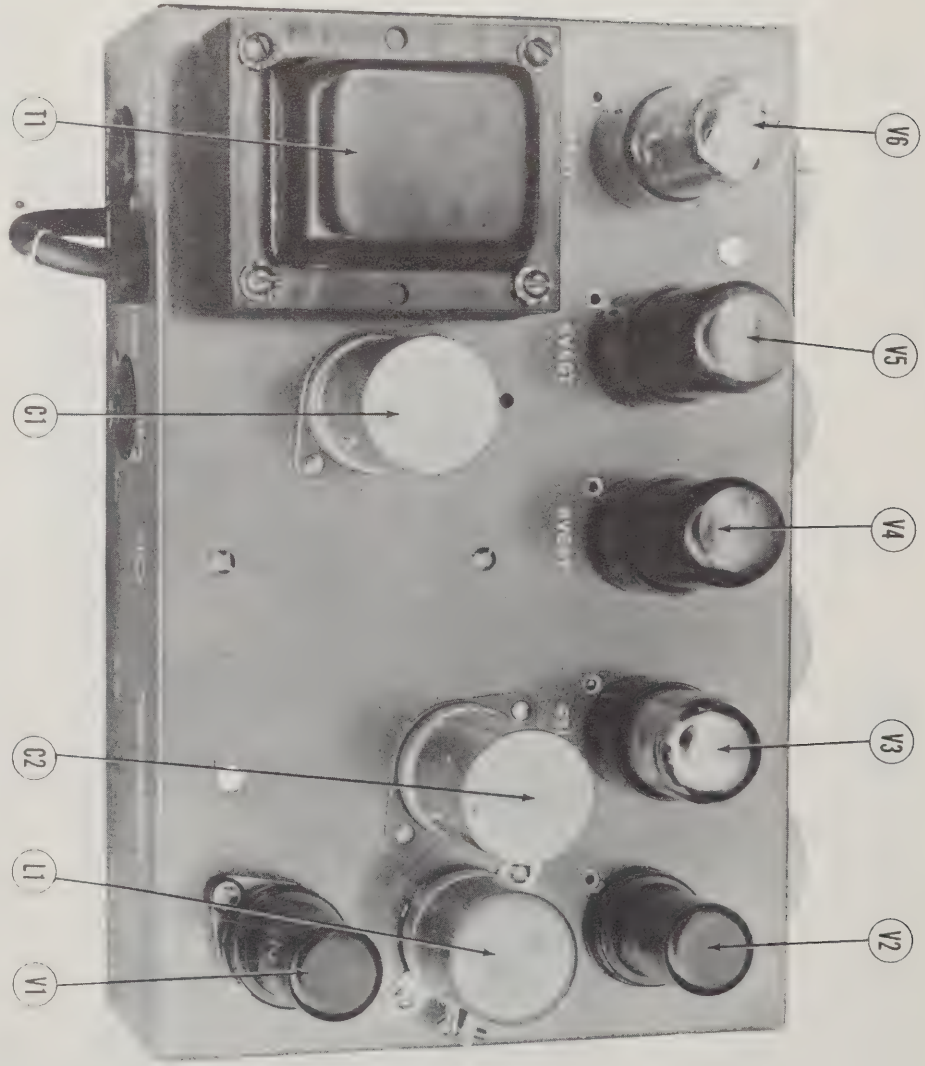
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DAVID BOGEN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1	500KΩ	½	V-202B	Q13-133	M-60-Z	B-60	Volume control
R2	500KΩ	½	V-284	Q13-133	M-60-Z	B-60	Bass tone control
R3	500KΩ	½	V-284	Q13-133	M-60-Z	B-60	Treble tone control

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DAVID BOGEN PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R4	100KΩ	½		BTS-100K	High Output Magnetic Shunt
R5	47KΩ	½		BTS-47K	Tone Compensation
R6	1 Meg.	½		BTS-1 Meg.	Pre.Amp Grid
R7	47KΩ	½		BTS-47K	Pre. Amp Plate
R8	68KΩ	½		BTS-68K	Pre. Amp Plate
R9	100KΩ	½		BTS-100K	Pre. Amp Plate Decoupling
R10	100KΩ	½		BTS-100K	Tone Compensation
R11	15KΩ	½		BTS-15K	Tone Compensation
R12	1 Meg.	½		BTS-1 Meg.	Pre. Amp. Grid
R13	470KΩ	½		BTS-470K	1st AF Amp. Grid

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	DAVID BOGEN PART No.	IRC PART No.	
R14	2200Ω	½		BTS-2200	1st AF Amp. Cathode
R15	33KΩ	½		BTS-33K	1st AF Amp. Cathode
R16	100KΩ	½		BTS-100K	1st AF Amp. Plate
R17	100KΩ	½		BTS-100K	Tone Compensation-See Note 1
R18	470KΩ	½		BTS-470K	2nd AF Amp. Grid
R19	2200Ω	½		BTS-2200	2nd AF Amp. Cathode
R20	2200Ω	½		BTS-2200	2nd AF Amp. Cathode
R21	220KΩ	½		BTS-220K	2nd AF Amp. Plate
R22	220KΩ	½		BTS-220K	2nd AF Amp. Plate
R23	100KΩ	½		BTS-100K	1st AF Amp. Plate Decoupling
R24	10KΩ	1		BTA-10K	AF Phase Inv. Grid
R25	220KΩ	½		BTS-220K	Output Grid
R26	220KΩ	½		BTS-220K	Output Grid
R27	1000Ω	½		BTS-1000	2nd AF Amp. Plate Decoupling
R28	270Ω	2		BW-2-270	Output Cathode
R29	22KΩ	½		BTS-22K	Audio Feedback
R30	47KΩ	2		BT-2-47K	Bleeder
R31	2200Ω	2		BT-2-2200	Filter-See Note 2
R32	250Ω	10		AB-250	Filter

Note 1. Not used in all models.
Note 2. Some models use a 3300Ω, 1 watt resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	DAVID BOGEN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .6A	700VCT .075ADC	5VAC @ 2A	6.3VAC @ 1.8A		P-6012	P-2952	PH-70B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		David Bogen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	9400Ω CT	16Ω 8Ω 4Ω	390Ω CT	.9Ω .6Ω .4Ω		A-3870	A-3027	RO-305	

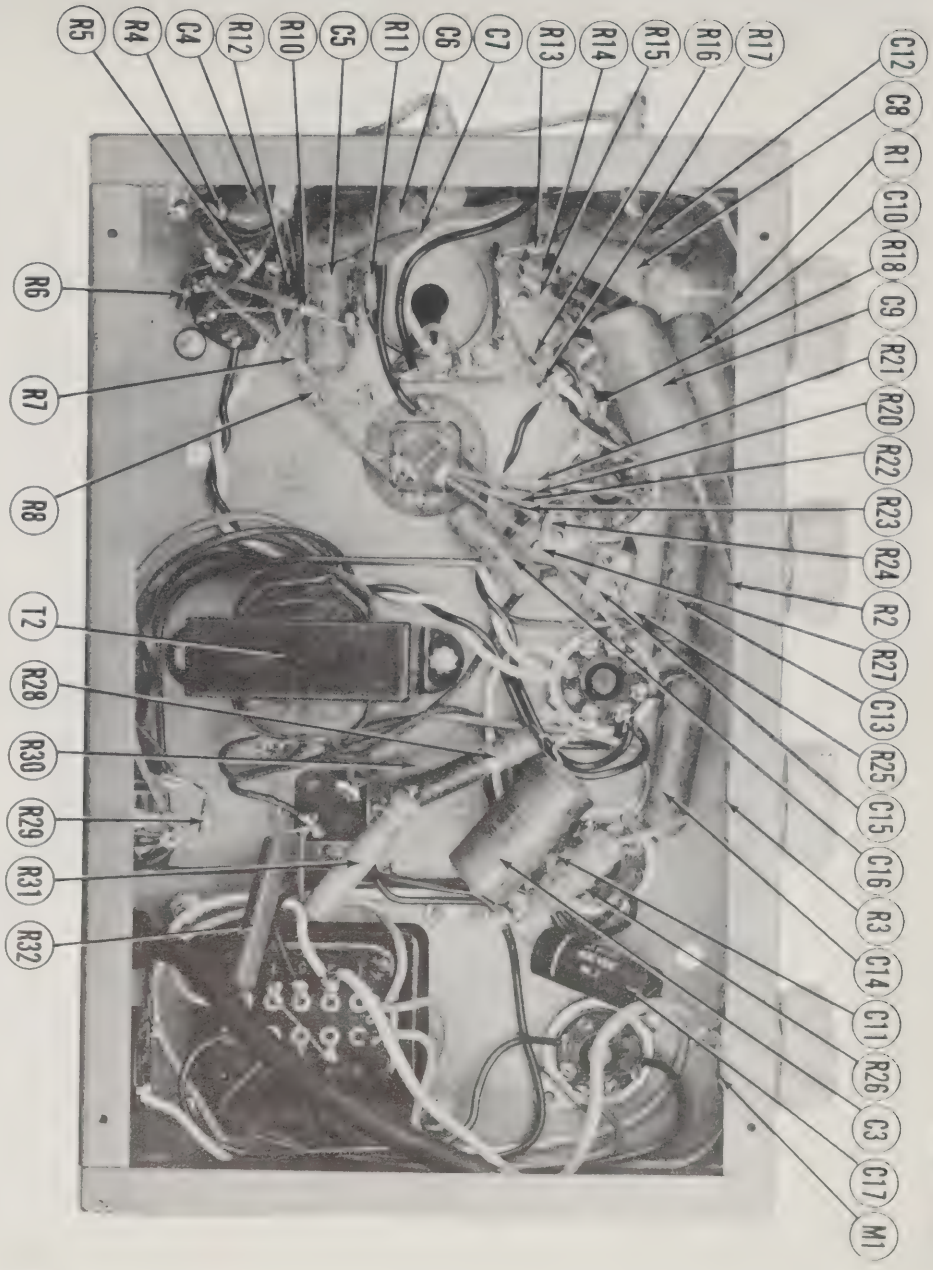
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	DAVID BOGEN PART No.	MEISSNER PART No.	
L1	Tone Compensator	700Ω				

MISCELLANEOUS

ITEM No.	PART NAME	DAVID BOGEN PART No.	NOTES
M1	Switch		On-Off

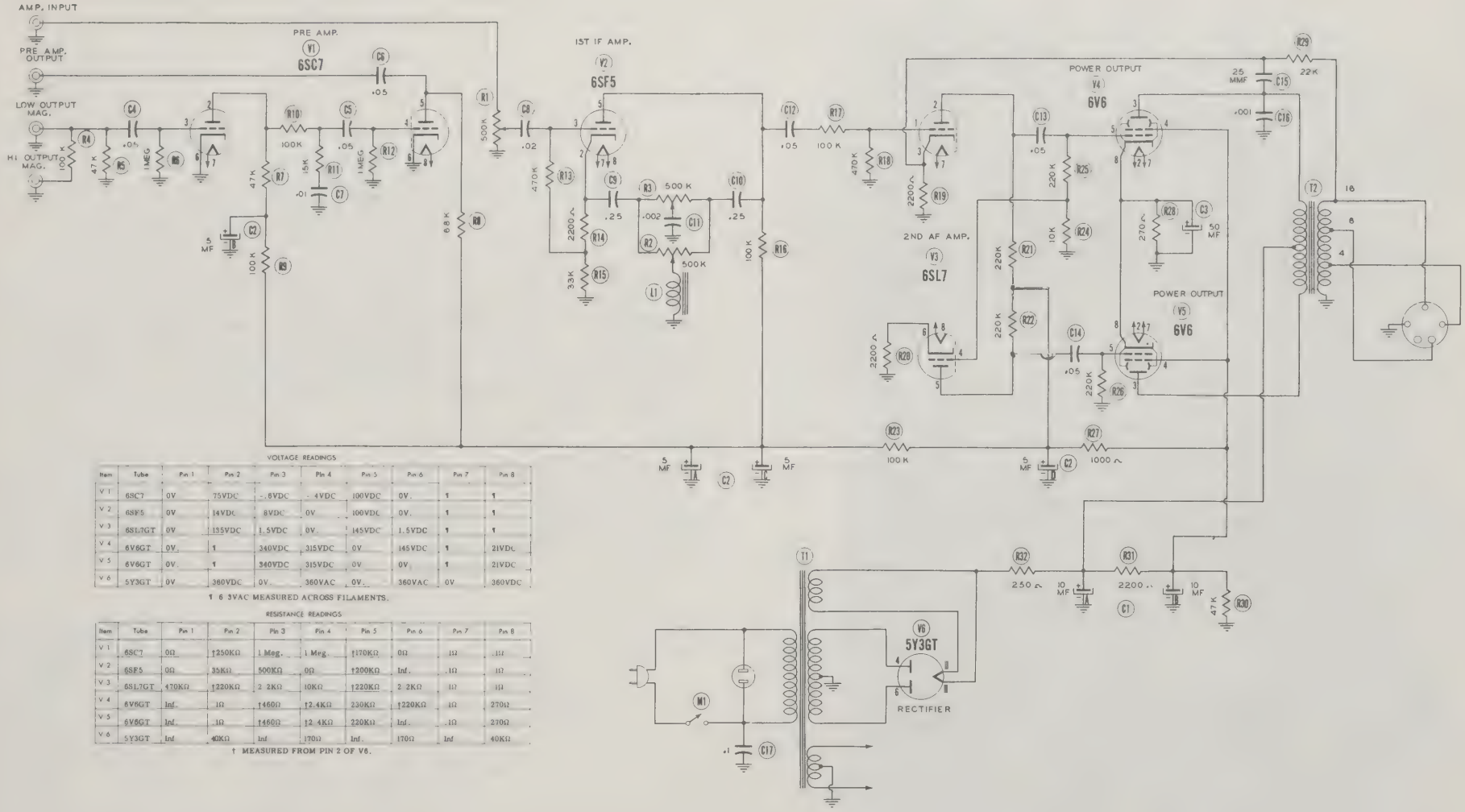
CHASSIS—BOTTOM VIEW



SET 102 FOLDER 4

DAVID BOGEN MODEL DB-10

DAVID BOGEN MODEL DB-10



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0V	75VDC	-.6VDC	-.4VDC	100VDC	0V.	†	†
V 2	6SF5	0V	14VDC	8VDC	0V	100VDC	0V.	†	†
V 3	6SL7GT	0V	135VDC	1.5VDC	0V.	145VDC	1.5VDC	†	†
V 4	6V6GT	0V.	†	340VDC	315VDC	0V	145VDC	†	21VDC
V 5	6V6GT	0V.	†	340VDC	315VDC	0V	0V	†	21VDC
V 6	5Y3GT	0V	360VDC	0V.	360VAC	0V.	360VAC	0V	360VDC

† 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0Ω	†250KΩ	1 Meg.	1 Meg.	†170KΩ	0Ω	1Ω	1Ω
V 2	6SF5	0Ω	35KΩ	500KΩ	0Ω	†200KΩ	Inf.	1Ω	1Ω
V 3	6SL7GT	470KΩ	†220KΩ	2.2KΩ	10KΩ	†220KΩ	2.2KΩ	1Ω	1Ω
V 4	6V6GT	Inf.	1Ω	†460Ω	†2.4KΩ	230KΩ	†220KΩ	1Ω	270Ω
V 5	6V6GT	Inf.	1Ω	†460Ω	†2.4KΩ	220KΩ	Inf.	1Ω	270Ω
V 6	5Y3GT	Inf	40KΩ	Inf	170Ω	Inf.	170Ω	Inf	40KΩ

† MEASURED FROM PIN 2 OF V6.

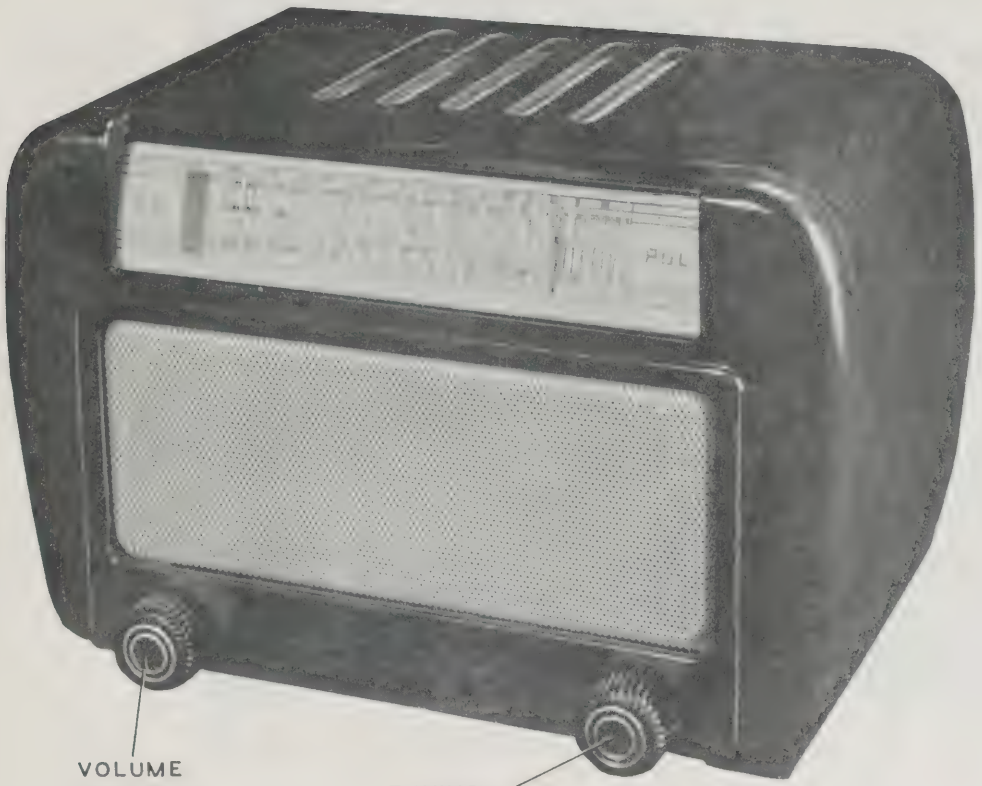
A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1950

102-4

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

DEWALD
MODEL D-616



DEWALD
MODEL D-616

DEWALD MODEL D-616

TRADE NAME	Dewald, Model D-616
MANUFACTURER	Dewald Radio Mfg. Corp., 35-15 37th Ave., Long Island City 1, New York
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (SIX)	Types 12BA6 RF Amp., 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50B5 Power Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC — RATING .26 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	525-1700KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and pointer to reference mark at the low frequency end of dial backplate.

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and chassis.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (Grid) of 12BE6 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.01MFD	High side to pin 1 (Grid) of 12BA6 (V1). Low side to chassis.	"	"	"	A5	Adjust for MINIMUM output.
3.	.01MFD	"	1700KC	"	"	A6	Adjust for maximum output.
4.		Loop	1500KC	Tune for max. output	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

DEWALD MODEL D-616

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amp.	12BA6	12BA6	7BK	
V4	DET-AVC-AF	12AT6	12AT6	7BT	
V5	Power Output	50B5	50B5	7BZ	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	150	2005-1	AF66D		UP3315		EL-230	■ Filter
B	30	150							▲ Filter
C2	.05	200		P288-05		PTE4S5		TM-15	AVC Filter
C3	.05	400		P488-05		PTE4S5		TM-15	RF Bypass
C4	100			GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
C5	.05	200		P288-05		PTE4S5		TM-15	IF Cath. Byp.
C6	220			GP220M	D6-221	5W5T25	GP2K-220	1FM-325	Diode RF Filter
C7	.01	400		P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C8	220			GP220M	D6-221	5W5T25	GP2K-220	1FM-325	AF Amp. Plate Byp.
C9	.01	400		P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C10	.02	400		P488-02		PTE4S2		TM-12	Output Plate Byp.
C11	.05	400		P488-05		PTE4S5		TM-15	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	3013-3	Q13-133	AM-60-Z	BSK-60-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A per instructions

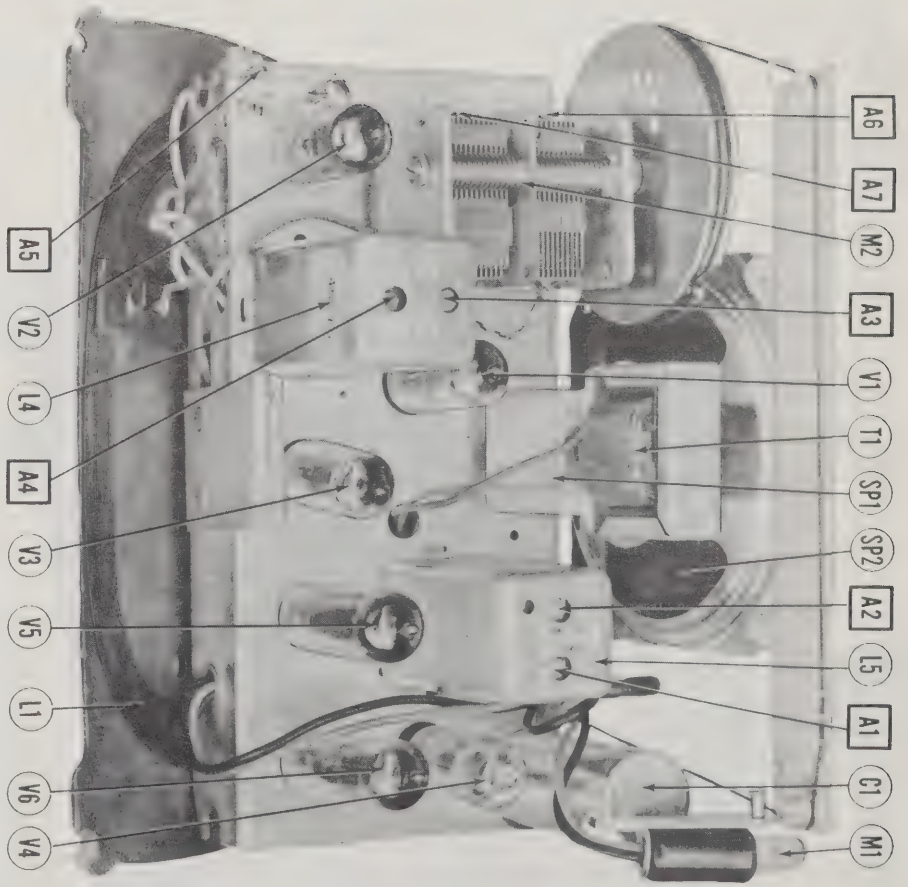
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	IDENTIFICATION CODES
R2	6800Ω	½		BTS-6800	RF Amp. Plate
R3	47KΩ	½		BTS-47K	Conv. Grid
R4	22KΩ	½		BTS-22K	Osc. Grid
R5	2.2 Meg.	½		BTS-2.2 Meg.	AVC Network
R6	220Ω	½		BW-½-220	IF Cathode
R7	470KΩ	½		BTS-470K	AF Plate
R8	4.7 Meg.	½		BTS-4.7 Meg.	AF Grid
R9	470KΩ	½		BTS-470K	Output Grid
R10	150Ω	½		BW-½-150	Output Cathode
R11	1500Ω	1		BTA-1500	Filter
R12	15Ω	½			Surge Limiter

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: DEWALD PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2000Ω	3.3Ω	165Ω	.5Ω	Part of SP1	A-3876 ①	A-2928 ①	RO-2 ①	① Bend mounting tabs down and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA DEWALD PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113 ②		
SP1	PM	3.3Ω	7000C-3	MOD. P4-X	4A07 ②	② Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

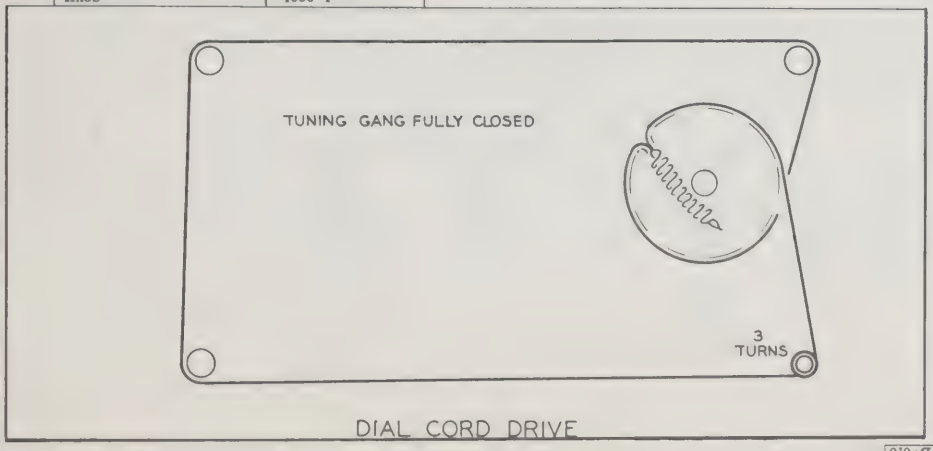
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA DEWALD PART No.	REPLACEMENT DATA MEISSNER PART No.	
L1	Loop Ant.	2.9Ω		1073A		
L2	Osc. Coil	6.2Ω		1011	14-1073	Tap at .9Ω
L3	Wave Trap	46Ω		1005		
L4	1st IF	21Ω	21Ω	1000-3	16-6658	
L5	2nd IF	22Ω	22Ω	10002B-3	16-6660	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA DEWALD PART No.		NOTES
M1	Bayonet	6-8	.15	Brown			Type #47

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M2	2 Gang Var. Cap.	2003C	(25-463MMF, 23-198MMF)
	Cabinet	4077C-2	
	Dial Scale	6000G-3	
	Dial Pointer	9113A-1	
	Knob	4080-4	

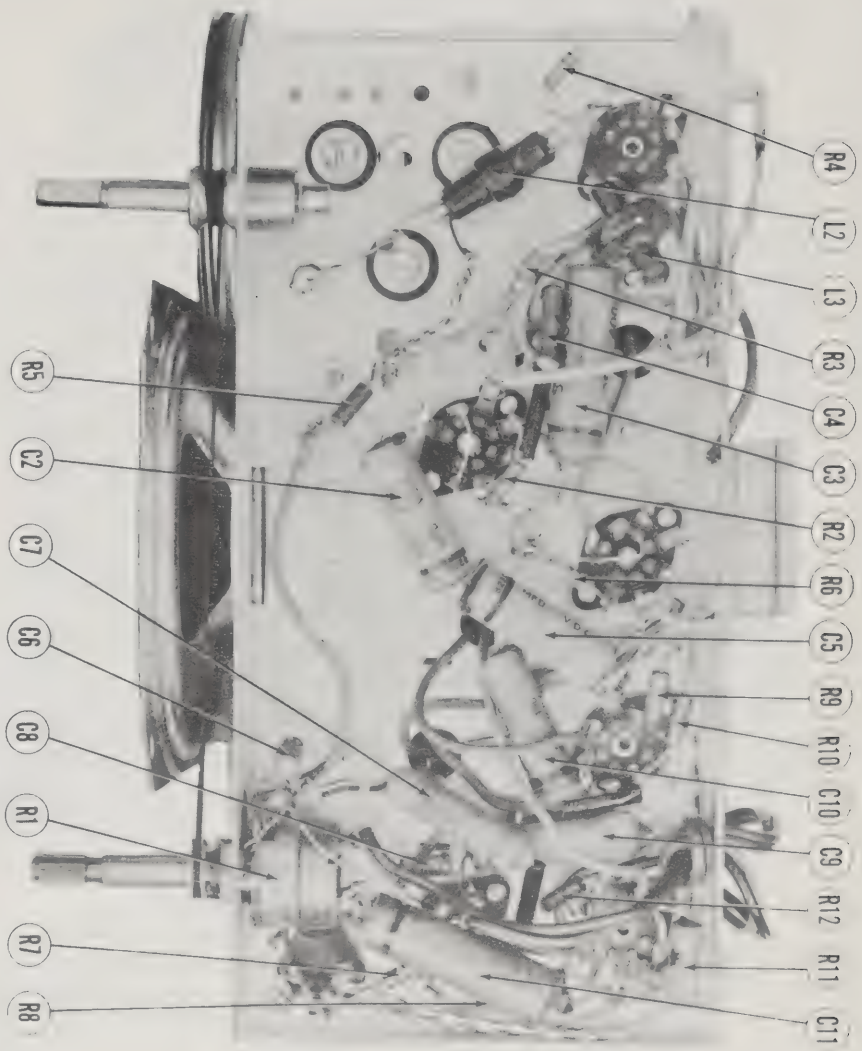


DIAL CORD DRIVE

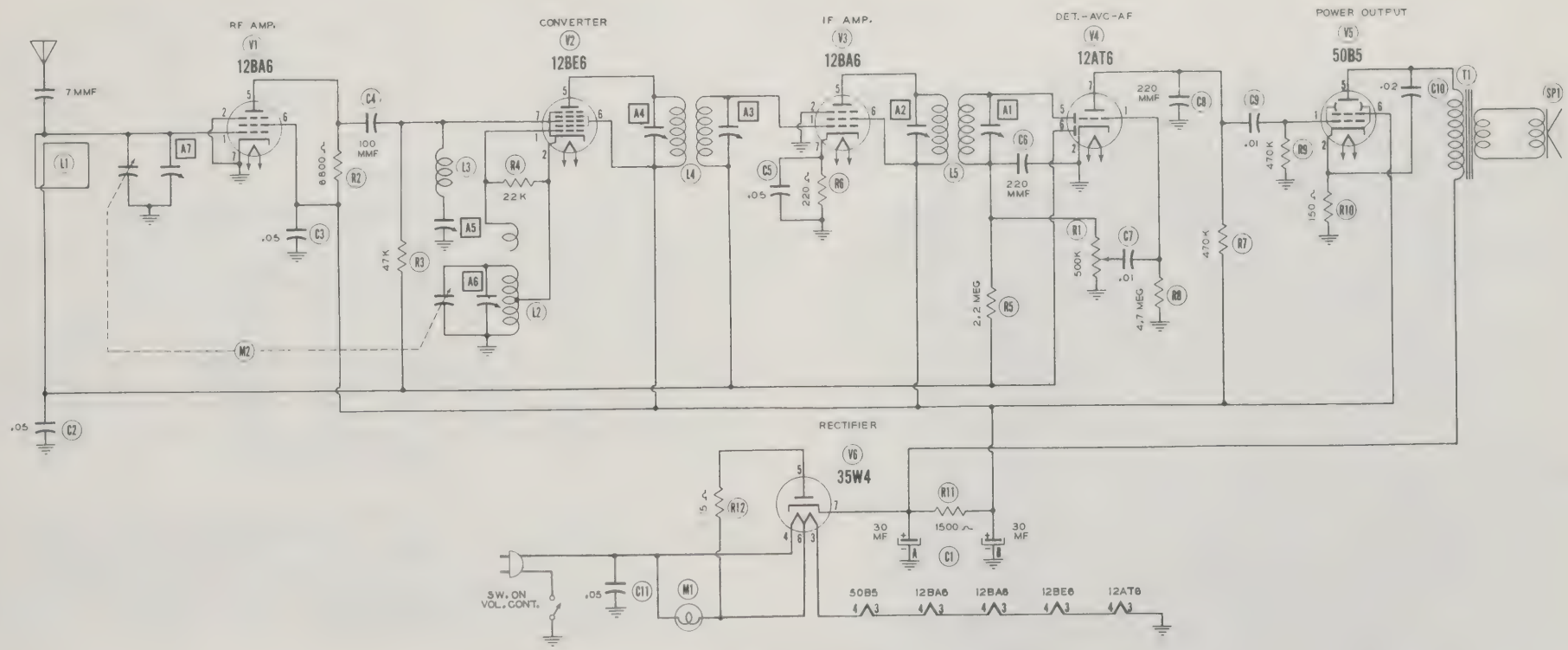
SET 102 FOLDER 5

DEWALD MODEL D-616

CHASSIS—BOTTOM VIEW



DEWALD MODEL D-616



IF = 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	.6VDC	0V	22VAC	33VAC	80VDC	85VDC	0V.
V 2	12BE6	§ 8.5VDC	0V.	12VAC	22VAC	85VDC	85VDC	4VDC
V 3	12BA6	6VDC	0V.	33VAC	45VAC	85VDC	85VDC	1 VDC
V 4	12AT6	. 4VDC	0V	12VAC	0V.	-.6VDC	-. 6VDC	30VDC
V 5	50B5	1VDC	5.7VDC	45VAC	90VAC	115VDC	85VDC	.1VDC
V 6	35W4	0V	85VDC	90VAC	117VAC	112VAC	115VAC	120VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	3 Meg.	0Ω	26Ω	40Ω	†8.3KΩ	†1.5KΩ	0Ω
V 2	12BE6	22KΩ	.9Ω	13Ω	26Ω	†1.5KΩ	†1.5KΩ	3 Meg.
V 3	12BA6	2.7 Meg.	0Ω	40Ω	53Ω	†1.5KΩ	†1.5KΩ	220Ω
V 4	12AT6	4.7 Meg.	0Ω	13Ω	0Ω	500KΩ	3.7 Meg.	†470KΩ
V 5	50B5	470KΩ	150Ω	53Ω	105Ω	†165Ω	†1.5KΩ	470KΩ
V 6	35W4	Inf.	†1.5KΩ	105Ω	140Ω	150Ω	135Ω	90KΩ

† MEASURED FROM PIN 7 OF V6.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

EMERSON MODELS 646-A, 646-B (Ch. 120121A, B) (BATTERY-LINE OPERATED)

EMERSON MODELS 646-A, 646-B (Ch. 120121A, B) (BATTERY-LINE OPERATED)

EMERSON MODELS 646-A, 646-B (Ch. 120121A, B) (BATTERY-LINE OPERATED)

EMERSON MODEL 646A

TRADE NAME	Emerson, Models 646A (Ch. 120121A), 646B (Ch. 120121B)
MANUFACTURER	Emerson Radio and Phonograph Corp., 111 8th Ave., New York 11, New York
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 1R5 Converter, 1U4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output, 117Z3 Rectifier
POWER SUPPLY	110-120 Volts AC-DC or 4.5 Volts "A" Supply and 90 Volts "B" Supply
RATING	.130 Amp. at 117 Volts AC or 95MA at 4.5 Volts DC and 12MA at 90 Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to last reference mark at low frequency end of dial backplate.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (Grid) of 1R5 (V1). Low side to chassis.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation.
2.	200MMF	High side to antenna terminal. Low side to chassis.	1620KC	"	"	A4	Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."

"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

EMERSON MODEL 646A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	800110	1R5	7AT	
V2	IF Amp.	800017	1U4	6AR	
V3	DET-AVC-AF	800019	1U5	6BW	
V4	Power Output	800018	3V4	6BX	
V5	Rectifier	800013	117Z3	4CB	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	150	925167-1 *						Filter-Red
B	30	150							Filter-Green
C	300	10							Filament Byp. -Yellow
C2	.05	200	920060	P288-05		PTE4S5		TM-15	AVC Filter
C3	.01	200	920092	P488-01	D6-103	PTE4S1	811-01	TM-11	Osc. Anode Dec.
C4	.01	200	920092	P488-01	D6-103	PTE4S1	811-01	TM-11	IF Grid Filter
C5	2.2		915005		D2-2.2				Neutralizing
C6	.05	200	920060	P288-05		PTE4S5		TM-15	Filament Bypass
C7	.1	200	920040	P288-1		PTE4P1		TM-1	Filament Bypass
C8A	100		928034	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
B	1000			GP1000M	D6-102	PTE6D1	GP2L-001	TM-21	Audio Coupling
C	10000			BPD-10	D6-103	PTE4S1	811-01	TM-11	AF Amp. Screen
D	100			GP100M	D6-101	5W5T1	GP1K-100	1FM-31	AF Amp. Plate
E	1000			GP1000M	D6-102	PTE6D1	GP2L-001	TM-21	Audio Coupling
C9	.002	600	920515	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Output Plate
C10	.05	400	920539	P488-05		PTE4S5		TM-15	Line Filter
C11	.05	400	920539	P488-05		PTE4S5		72P51	Line Isolation

* Chassis 120121-B uses MFGR'S Part No. 925186 in this application.

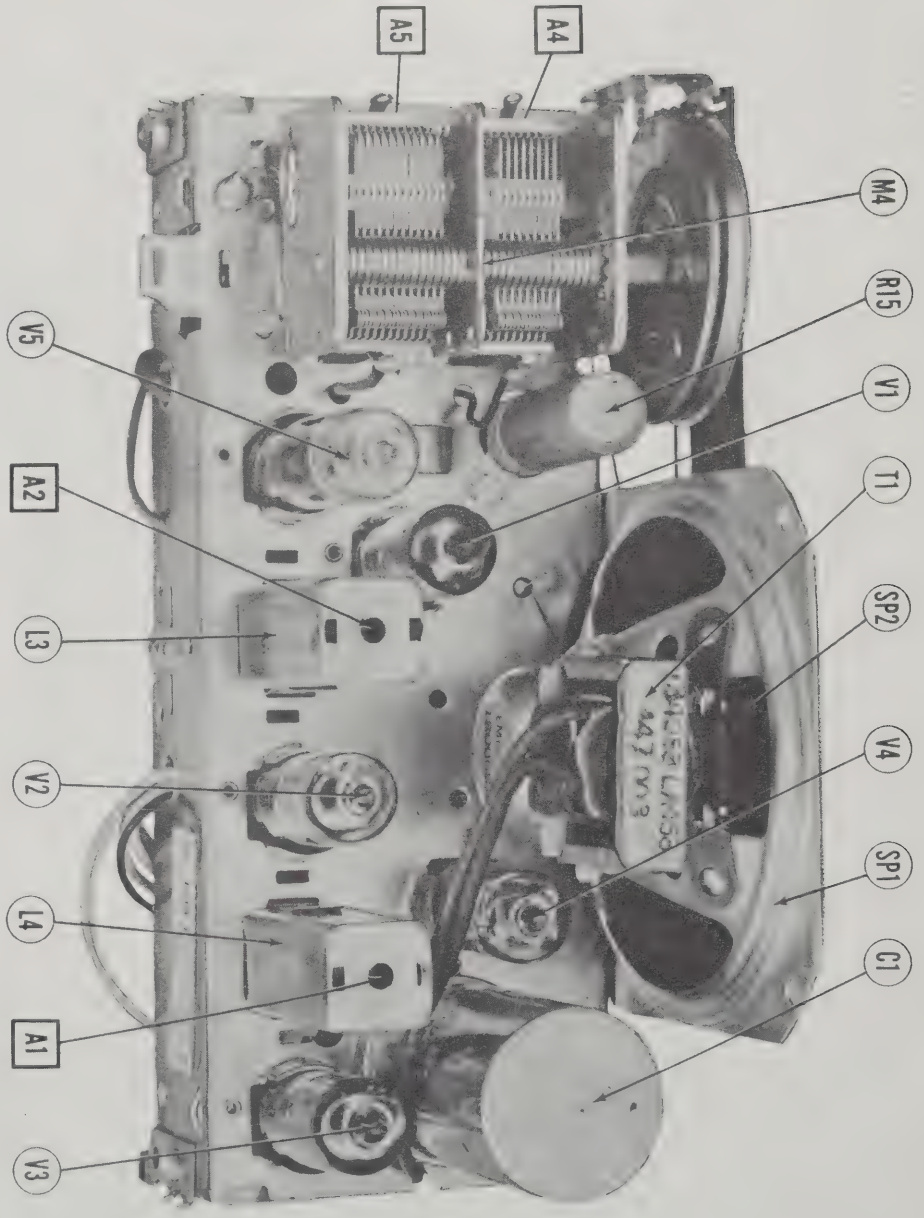
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1.5 Meg.	½	390051-1	Q13-137	AG-63-Z	BSK-70-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-2	SWB-2	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES
R2	100KΩ	½		BTS-100K	Osc. Grid
R3	15KΩ	½	340770	BTS-15K	Osc. Anode
R4	3.3 Meg.	½	351330	BTS-3.3 Meg.	IF Amp. Grid
R5	10 Meg.	½	351450	BTS-10 Meg.	AF Amp. Grid
R6	2.2 Meg.	½	351290	BTS-2.2 Meg.	AVC Network
R7	4.7 Meg.	½	351370	BTS-4.7 Meg.	AF Amp. Screen
R8	1 Meg.	½	341210	BTS-1 Meg.	AF Amp. Plate
R9	3.3 Meg.	½	351330	BTS-3.3 Meg.	Output Grid
R10	330Ω	½	340372	BW-½-330	Bias Network
R11	1000Ω	½	340492	BTS-1000	Filament String
R12	27Ω	½	340112	BW-½-27	Filament String
R13	820Ω	½	340472	BTS-820	Filament String
R14	1000Ω	½	340492	BTS-1000	Filament String
R15	2200Ω	10	394095		Filament Dropping
R16	1500Ω	½	340532	BTS-1500	Filter
R17	47Ω	1	370172		Surge Limiter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	-
	PRI.	SEC.	PRI.	SEC.					
T1	11KΩ	3.7Ω	550Ω	.4Ω	734063B	A-3329 ①	A-2927 ①	RO-16 ①	① Bend mounting tabs down and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-113		
SP1	PM	3.4Ω	180068	MOD. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4 1/8"	9/16"				

R F COILS

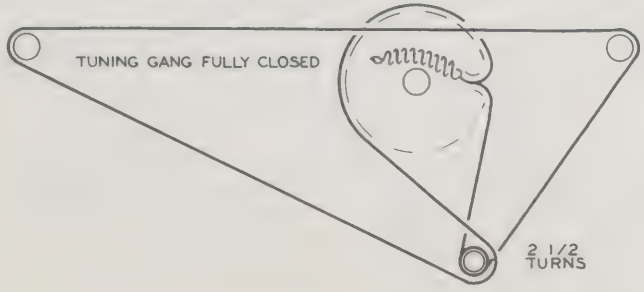
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	
L1	Loop Ant.	3.5Ω		700627		
L2	Osc. Coil	1.5Ω	7.3Ω	716017-1	14-1074	
L3	1st IF	21Ω	21Ω	720062	16-6668	
L4	2nd IF	25Ω	34Ω	720066A	16-6669	

BATTERIES

ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	4.5V "A"		726			D3			
M2	90V "B"			490			N60		

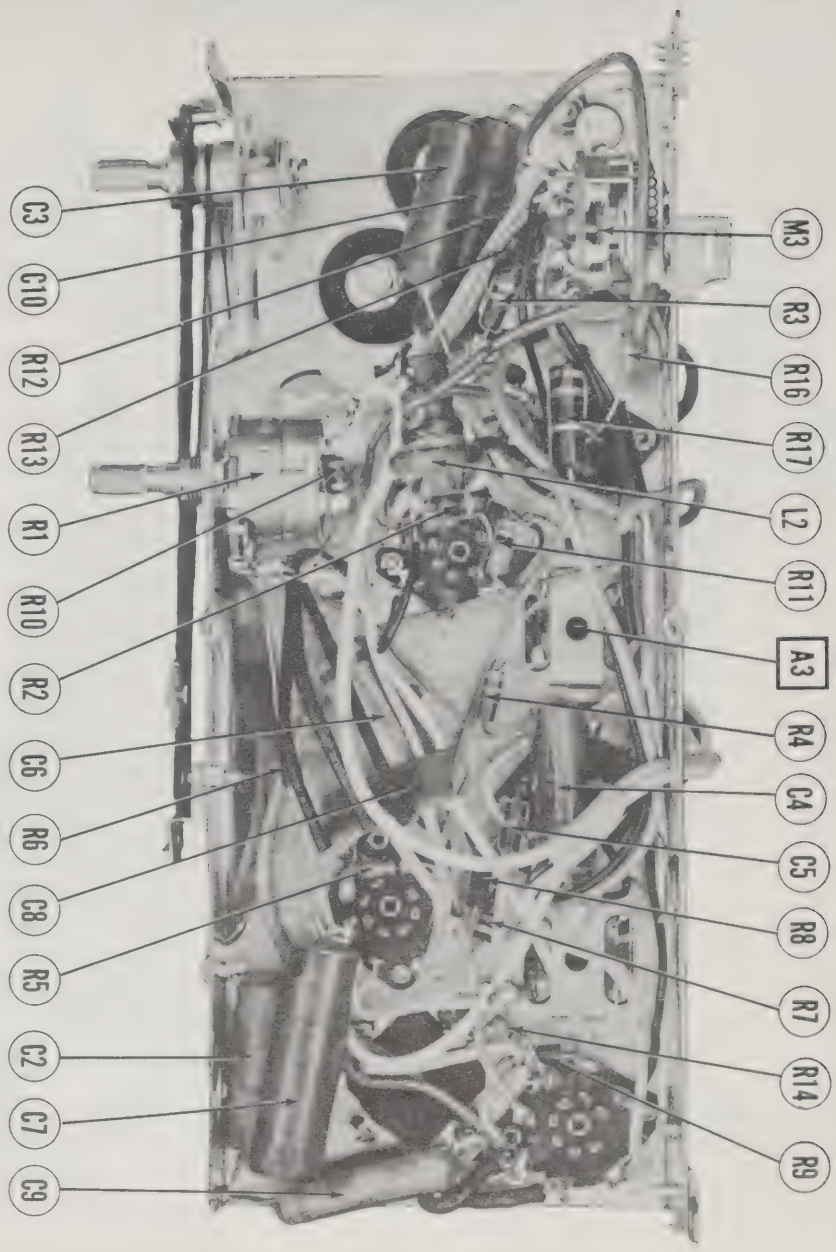
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3A	Switch	510075	AC/DC-Battery (Model 646A)
B	Switch	510073	AC/DC-Battery (Model 646B)
M4	2 Gang Var. Cap.	900160-1	(15-406MMF, 32-225MMF)
	Cabinet	140352	Maroon
	Cabinet	140366	Tan
	Cabinet	140364	Green
	Cabinet	140365	Ivory
	Knob	460162-S	
	Dial Pointer	525054	



DIAL CORD DRIVE

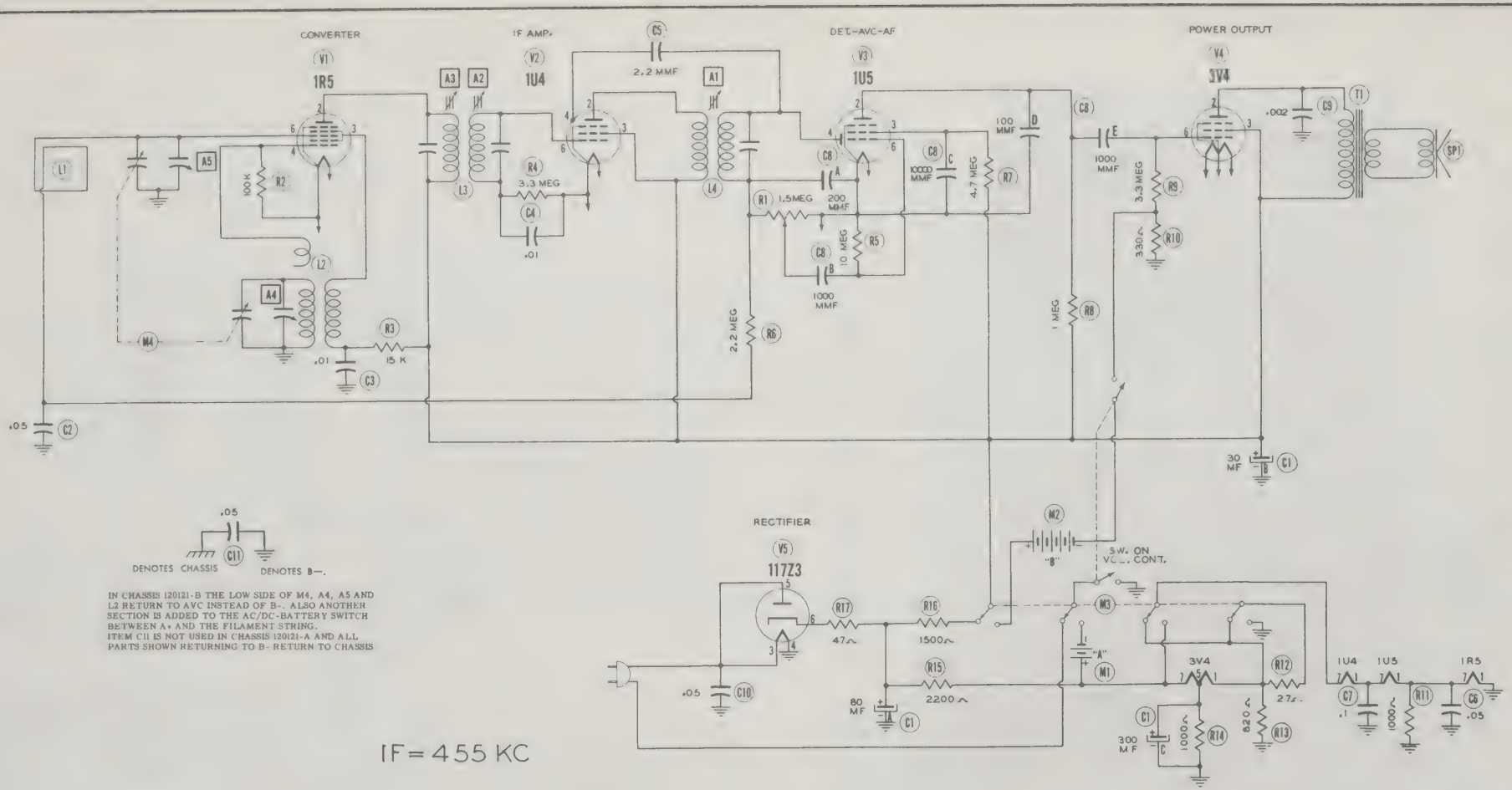
CHASSIS—BOTTOM VIEW



SET 102 FOLDER 6

EMERSON MODEL 646A

EMERSON MODEL 646A



IN CHASSIS 120121-B THE LOW SIDE OF M4, A4, A5 AND L2 RETURN TO AVC INSTEAD OF B-. ALSO ANOTHER SECTION IS ADDED TO THE AC/DC-BATTERY SWITCH BETWEEN A+ AND THE FILAMENT STRING. ITEM C11 IS NOT USED IN CHASSIS 120121-A AND ALL PARTS SHOWN RETURNING TO B- RETURN TO CHASSIS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0V.	85VDC	55VDC	8-9.4VDC	0V.	.1VDC	1.3VDC
V 2	1U4	2.6VDC	85VDC	85VDC	0V.	2.6VDC	.1VDC	3.7VDC
V 3	1U5	1.3VDC	16VDC	13VDC	.1VDC	.1VDC	0V.	2.6VDC
V 4	3V4	3.7VDC	80VDC	85VDC	0V.	4.8VDC	0V.	6.2VDC
V 5	117Z3	117VAC	105VDC	117VAC	0V.	117VAC	107VDC	105VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†1.5KΩ	†17KΩ	100KΩ	*	3.7 Meg.	*
V 2	1U4	*	†1.5KΩ	†1.5KΩ	Inf.	*	3.3 Meg.	*
V 3	1U5	*	†1 Meg.	†4.7 Meg.	1.5 Meg.	3.7 Meg.	10 Meg.	*
V 4	3V4	*	†2KΩ	†1.5KΩ	330Ω	*	3.3 Meg.	*
V 5	117Z3	50Ω	2.2KΩ	350Ω	0Ω	350Ω	2.2KΩ	2.2KΩ

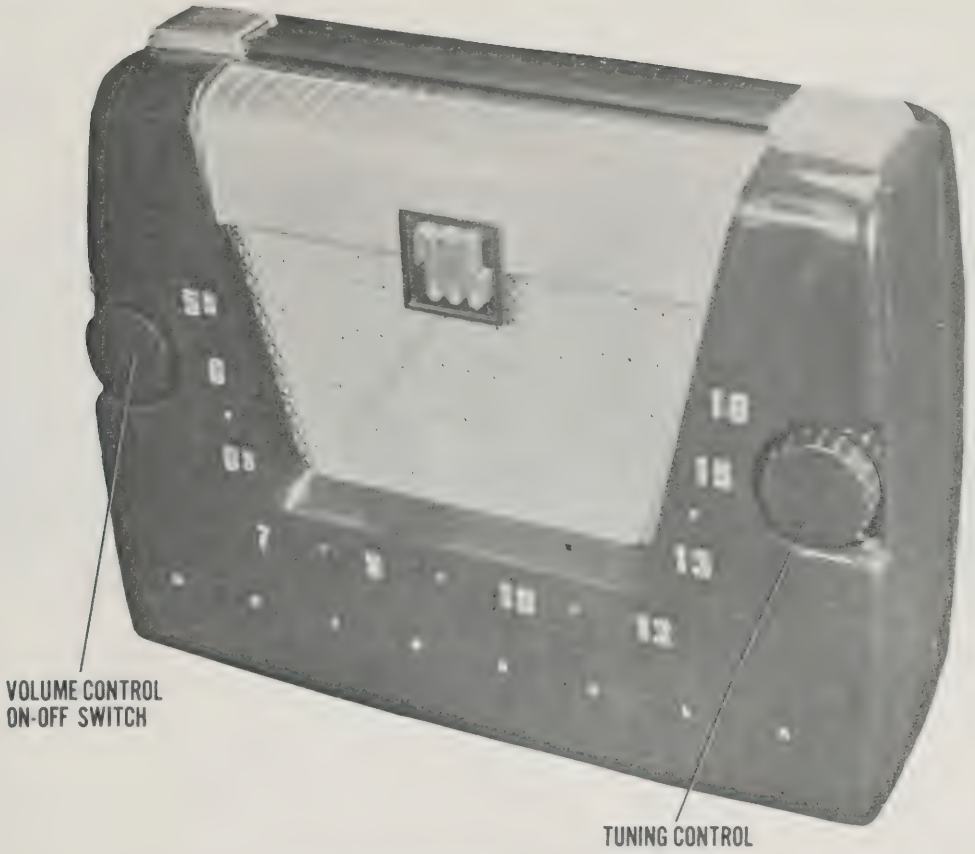
† MEASURED FROM PIN 6 OF V5.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MOTOROLA MODELS 6L1, 6L2
(Ch. HS-226) (BATTERY-LINE OPERATED)



MOTOROLA MODELS 6L1, 6L2
(Ch. HS-226) (BATTERY-LINE OPERATED)

MOTOROLA MODEL 6L1

TRADE NAME	Motorola, Models 6L1, 6L2 (Ch. HS-226)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 1U4 RF Amp., 1R5 Converter, 1U4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC or 9 Volts "A" Supply and 90 Volts "B" Supply in Pack Form
RATING	.12 Amp. at 117 Volts AC or 50MA at 9 Volts DC and 12MA at 90 Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to hole in dial backplate at the low frequency end of scale.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (Grid) of 1R5 (V2). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation.
2.	.1MFD	High side to pin 6 (Grid) of 1U4 (V1). Low side to B-.	1620KC	"	"	A5	Adjust for maximum output.
3.	.1MFD	"	1400KC	Tune for max. output.	"	A6	"
4.		Loop	"	"	"	A7	Install chassis in cabinet. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."

"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 6L1

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	1U4	1U4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amp.	1U4	1U4	6AR	
V4	DET-AVC-AF	1U5	1U5	6BW	
V5	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	23K76985						▲ Filter
B	40	150							■ Filter
C	20	150							▲ Filter
D	80	25							Filament Bypass
C2	.05	100	8K71213	P288-05		PTE4S5		TM-15	AVC Filter
C3	10000		21K482726	BPD-10	D6-103	PTE4S1	811-01	36C1	AVC Filter
C4	100		21B77286	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
C5	10000		21K482726	BPD-10	D6-103	PTE4S1	811-01	36C1	Osc. Anode Bypass
C6	10000		21K482726	BPD-10	D6-103	PTE4S1	811-01	36C1	IF Grid Filter
C7A	220		21B482847						Diode RF Filter
B	2000							34C3	Audio Coupling
C	220								AF Amp. Plate
D	5000								Audio Coupling
C8	10000		21K482726	BPD-10	D6-103	PTE4S1	811-01	36C1	AF Amp. Screen
C9	.05	100	8K71213	P285-05		ZYW1S5		68P16	Filament Bypass
C10	5000		21A470789	BPD-5	D6-502	ZYW4D5	811-005	29C1	Output Plate Bypass
C11	.1	200	8R490210	P288-1		PTE4P1		72P52	Line Isolation
C12	.05	400	8K471635	P485-05				68P10	Line Filter

CONTROLS

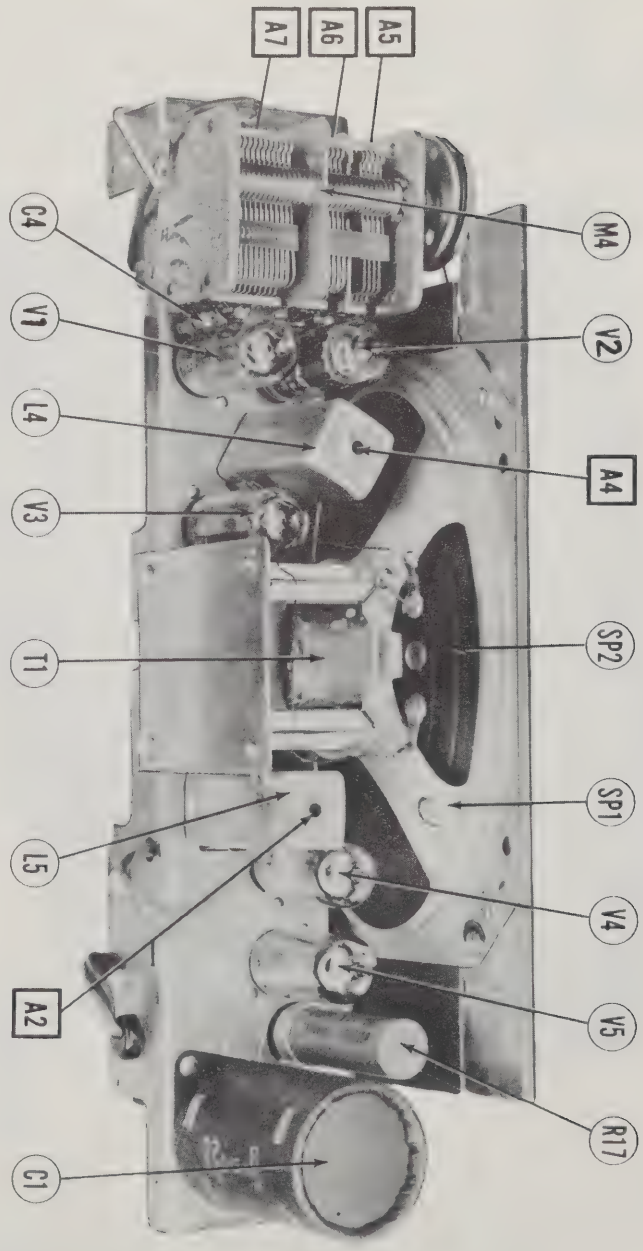
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	18K480039	Q13-137	AG-63-2	BSK-70-S	Volume control and switch
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-2	SWB-2	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R2	3.3 Meg.	½	6R2118	BTS-3.3 Meg.	RF Amp. Grid
R3	2.2 Meg.	½	6R3927	BTS-2.2 Meg.	AVC Network
R4	5.6 Meg.	½	6R3988	BTS-5.6 Meg.	AVC Network
R5	2.2 Meg.	½	6R3927	BTS-2.2 Meg.	AVC Network
R6	100KΩ	½	6R6075	BTS-100K	Osc. Grid
R7	330Ω	½	6R6010	BW-½-330	Conv. Grid
R8	33KΩ	½	6R6012	BTS-33K	Screen Dropping
R9	8.2 Meg.	½	6R5585	BTS-8.2 Meg.	IF Grid
R10	1 Meg.	½	6R6004	BTS-1 Meg.	IF Transformer Shunt
R11	10 Meg.	½	6R2109	BTS-10 Meg.	AF Amp. Grid
R12	2.2 Meg.	½	6R3927	BTS-2.2 Meg.	AF Amp. Screen-See Note 1
R13	1 Meg.	½	6R6004	BTS-1 Meg.	AF Amp. Plate
R14	3.3 Meg.	½	6R2118	BTS-3.3 Meg.	Output Grid
R15	220Ω	½	6R3933	BW-½-220	Filament String
R16	470Ω	½	6R3949	BTS-470	Filament String
R17A	1000Ω	10	17B692047		Filter-Wire Wound
B	1000Ω				Filament Dropping-Wire Wound
R18	820Ω	½	6R6269	BTS-820	Filament
R19	150Ω	2.5	17A76986		Surge Limiter-Wire Wound
R20	1000Ω	½	6R6301	BTS-1000	RF Amp. Plate

Note 1. Some models use a 3.3 Meg. resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	9000Ω	3.3Ω	600Ω	.6Ω	25B692076	A-3329	A-2932	RO-16	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	VIKING PART No.	QUAM PART No	
SP1	FIELD	V. C. IMP.	50C692044	46J6	46A07	
	PM	3.3Ω				
SP2	CONE DIA.	V. C. DIA.				
	6" x 4"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Loop Ant.	2.5Ω		24C692074		Includes panel
L2	RF Coil	7Ω	11Ω	24B692115		
L3	Osc. Coil	5Ω	15Ω	24B692114	14-1074	
L4	1st IF	36Ω	36Ω	24K600013	16-6668	
L5	2nd IF	36Ω	36Ω	24K600013	16-6669	

SELENIUM RECTIFIER

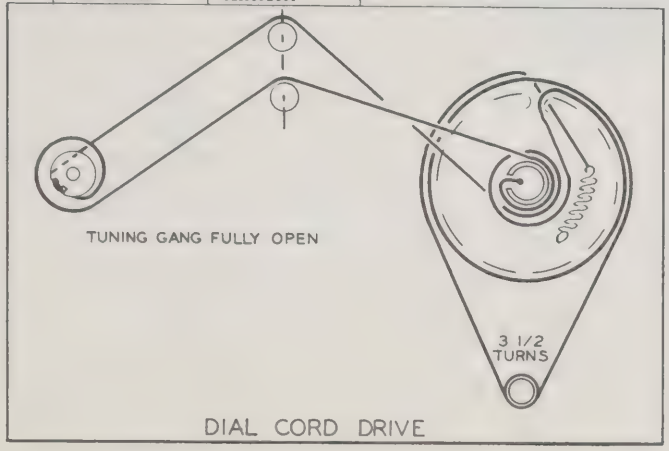
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.		
M1	.059A	48K692077	NB-5		

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"				753			F6A60	

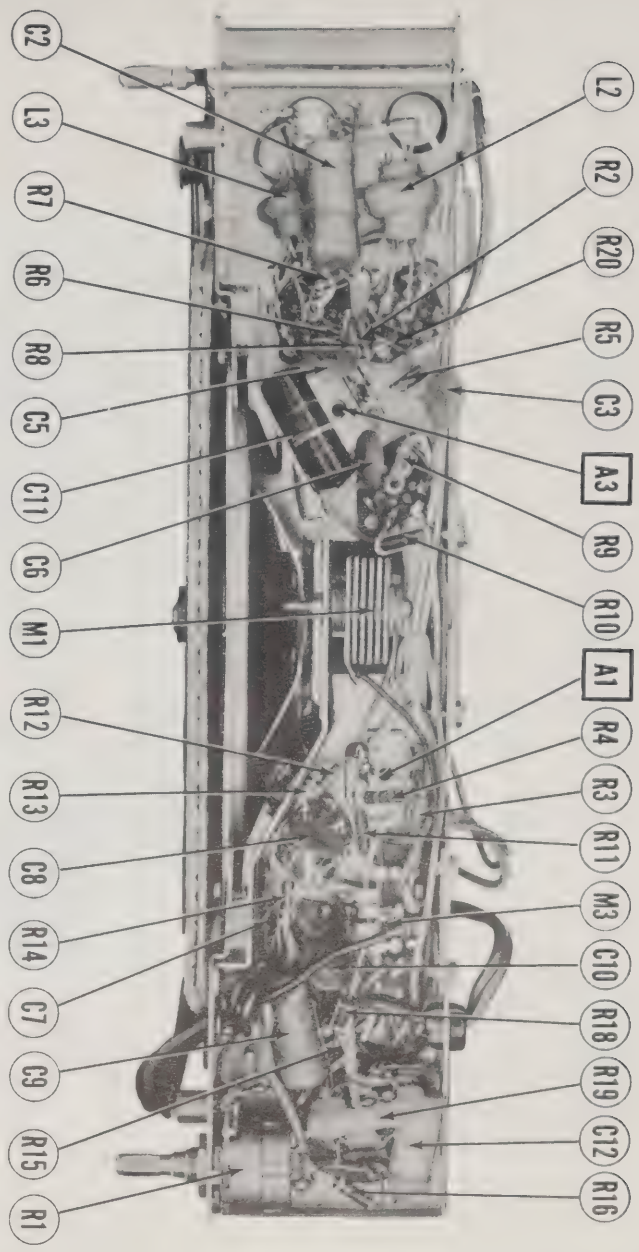
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Switch	40A27114	AC/DC-Battery
M4	3 Gang Var. Cap.	19B692045	(30-432MMF, 16-226MMF, 12-157MMF)
	Dial Pointer	52A692091	



DIAL CORD DRIVE

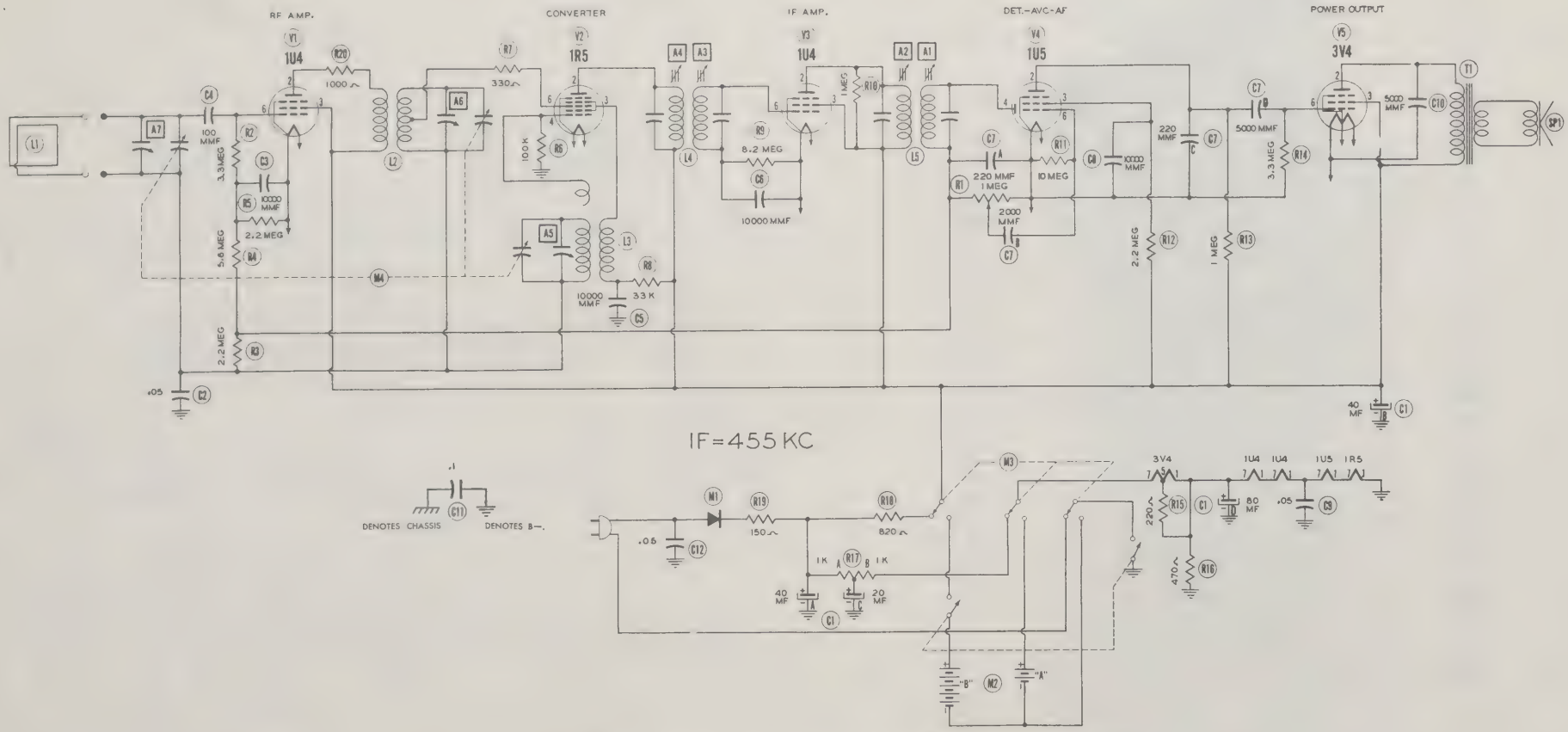
CHASSIS—BOTTOM VIEW



SET 102 FOLDER 7

MOTOROLA MODEL 6L1

MOTOROLA MODEL 6L1



VOLTAGE AND RESISTANCE READINGS TAKEN IN AC/DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	2.4VDC	80VDC	80VDC	43VDC	2.4VDC	.1VDC	3.4VDC
V 2	1R5	0V.	80VDC	43VDC	5-5.8VDC	0V.	.1VDC	1.2VDC
V 3	1U4	3.4VDC	80VDC	80VDC	0V.	3.4VDC	.1VDC	4.4VDC
V 4	1U5	1.2VDC	5.7VDC	18VDC	.2VDC	1.2VDC	0V.	2.4VDC
V 5	3V4	4.4VDC	75VDC	80VDC	117VAC	5.5VDC	.1VDC	7VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	*	†2KΩ	†970Ω	36KΩ	*	5 Meg.	*
V 2	1R5	*	†970Ω	†34KΩ	100KΩ	*	3 Meg.	*
V 3	1U4	*	†1000Ω	†920Ω	Inf.	*	8.2 Meg.	*
V 4	1U5	*	†1 Meg.	†2.2 Meg.	1 Meg.	*	10 Meg.	*
V 5	3V4	*	†1.6KΩ	†970Ω	1.5 Meg.	*	3.3 Meg.	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

MOTOROLA MODELS

6L1, 6L2, 16F1, 16K2, 16T1

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 16F1

MOTOROLA MODELS

6L1, 6L2, 16F1, 16K2, 16T1

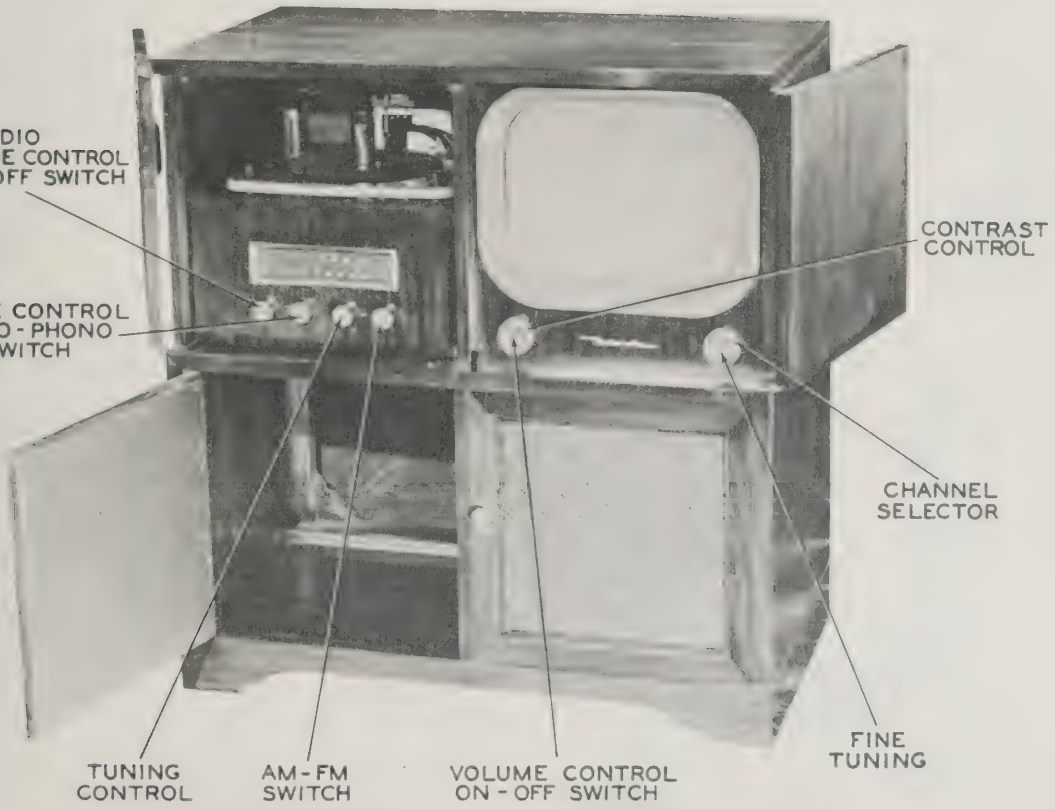
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 7/50 Set No. 102—Folder No. 8

PHOTOFACT* Folder

MOTOROLA MODELS 16F1, 16K2, 16T1 (Ch. TS-60, TS-74 & Radio Ch. HS-234)



MOTOROLA MODEL 16F1

TRADE NAME	Motorola, Models 16F1, 16K2, 16T1 (Ch. TS-60, TS-74 and Radio Chassis HS-234)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	TV-AM-FM-Phono Combination Receiver
TUBES	Twenty Six (Combination Receivers) Twenty (TV Only Models)
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.7 Amp. at 117 Volts AC
TUNING RANGE—TV	Channels 2 thru 13, FM 88-108MC, AM 540-1620KC

INDEX

Alignment Instructions 6, 7

Block Diagram 20

Dial Cord Stringing 16

Disassembly Instructions 10

Horiz. Sweep Circuit Adjustment 10

Parts List and Description ..... 21 thru 25

Photographs

Cabinet-Rear View 10

Capacitor Identification (Radio) 14

Capacitor Identification (TV) 11, 18

Chassis-Top View (Radio) 13

Photographs (continued)

Chassis-Top View (TV) 3, 16

Resistor Identification (Radio) 15

Resistor Identification (TV) 12, 17

Trans., Inductor and Alignment Identification (TV) 4, 9

Schematic (Radio) 19, 26

Schematic (TV) 2

Tube Placement Chart 5

Voltage and Resistance Measurements (Radio) 19, 26

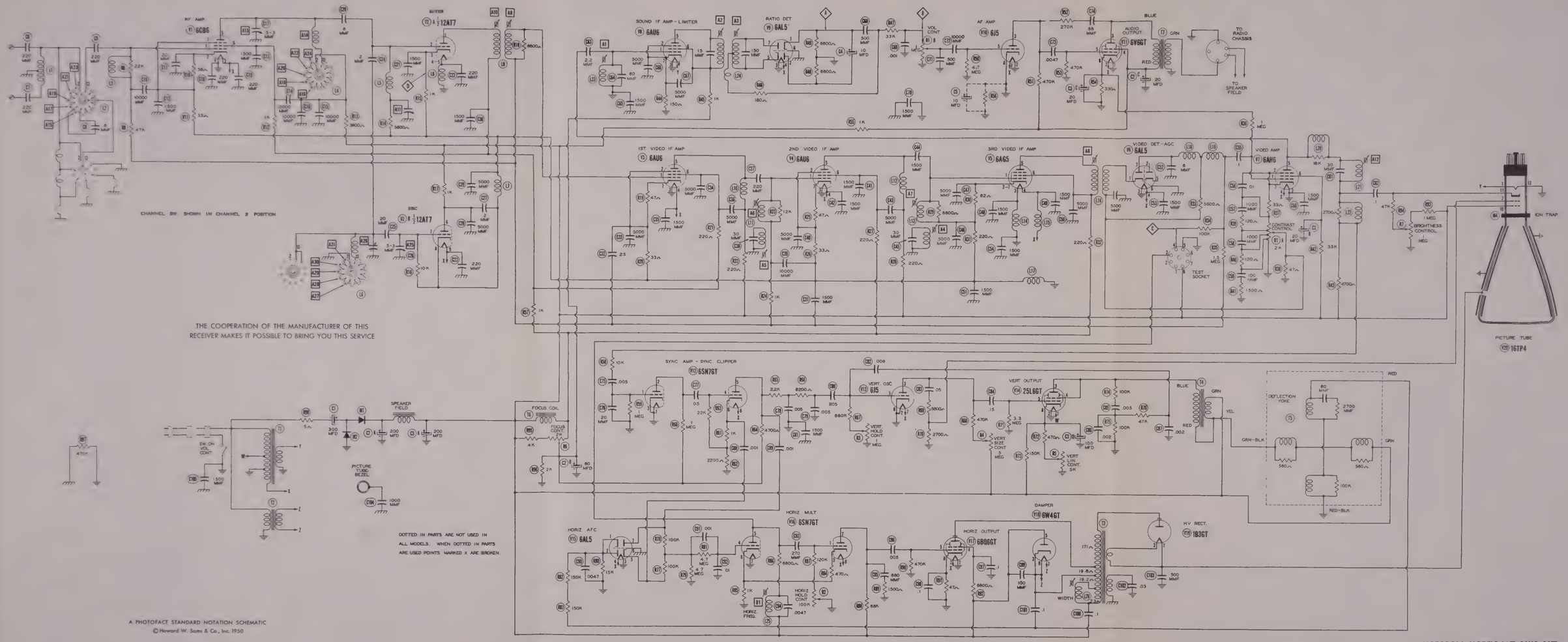
Voltage and Resistance Measurements (TV) 8

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 7-50 SET 102 FOLDER 8

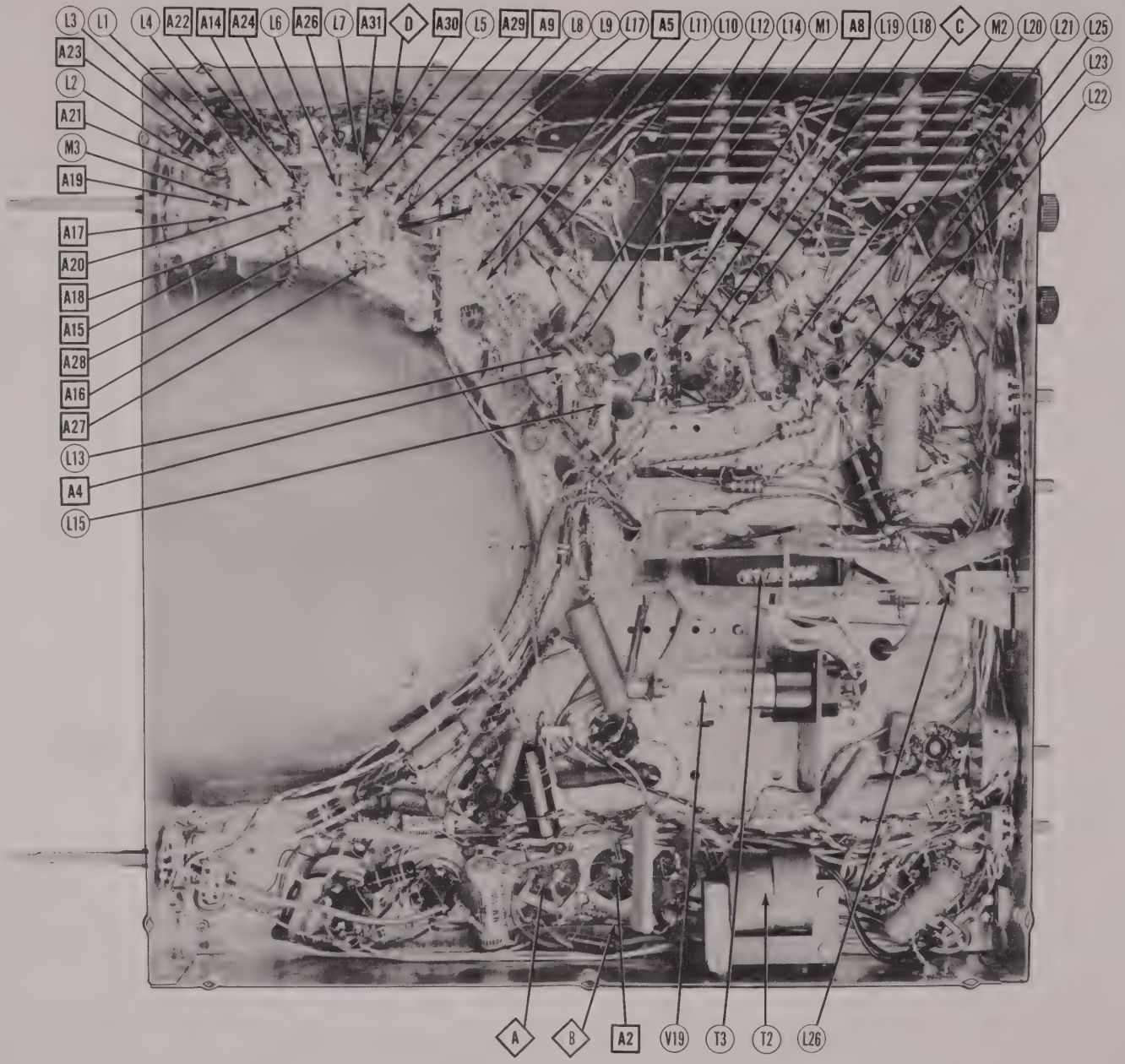
MOTOROLA MODELS 16F1, 16K2, 16T1 (Ch. TS-60, TS-74 & Radio Ch. HS-234)



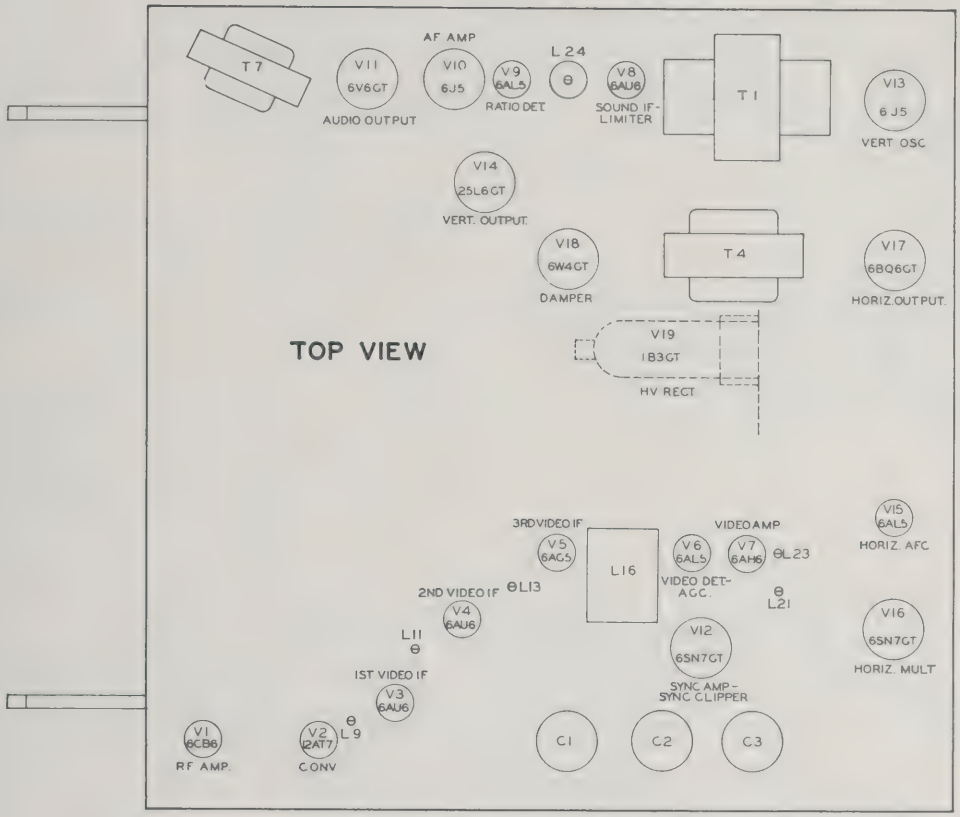
MOTOROLA MODELS 16F1, 16K2, 16T1
(Ch. TS-60, TS-74 & Radio Ch. HS-234)

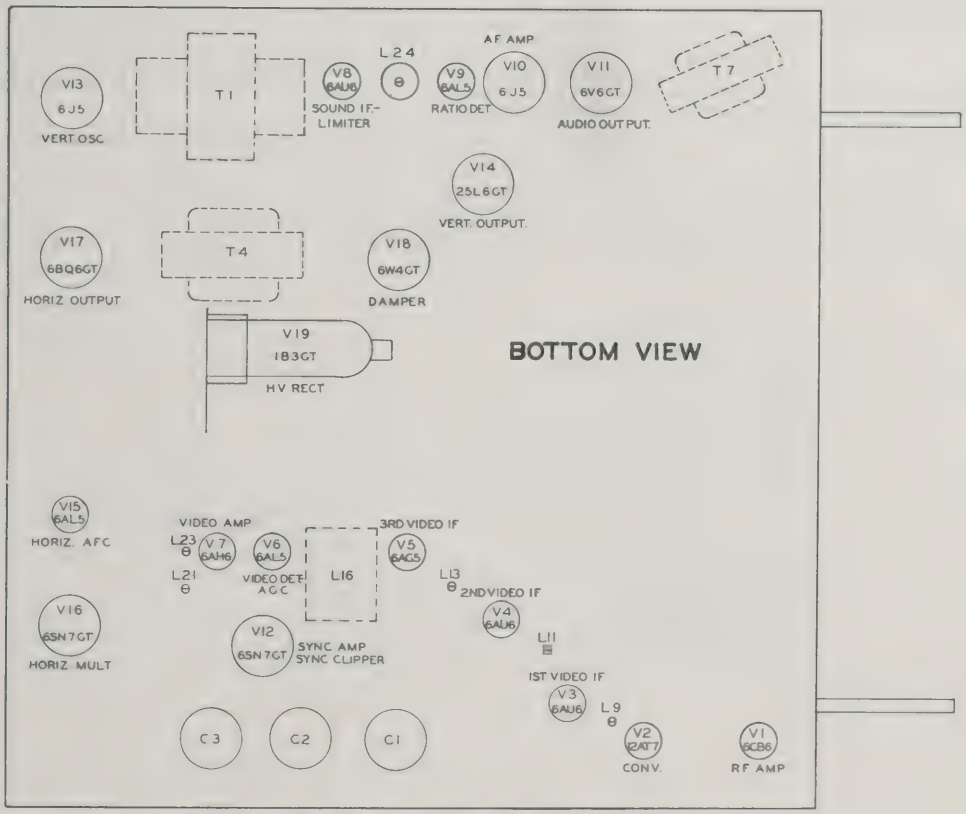
MOTOROLA MODELS 16F1, 16K2, 16T1
(Ch. TS-60, TS-74 & Radio Ch. HS-234)

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage shock hazard may be eliminated by removing the horizontal output tube (V17) from its socket.

SOUND IF ALIGNMENT

Turn contrast control fully clockwise. Connect 10KΩ resistor in series with the common lead of VTVM.
Use frequency modulated signal with 60 % modulation and 450KC sweep. Use 120 % sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (Grid) of 6AH6 (V7). Low side to B-.	4.5MC (450KC Sweep)	4.5MC	Any channel not used locally	Vert. Amp. to Point A. Low side to B-.	A1, A2	Disconnect stabilizer capacitor C4. Adjust for maximum amplitude and symmetry as per figure 1.
2.	.001MFD	"	"	"	"	Vert. Amp. to Point B. Low side to B-.	A3	Reconnect capacitor C4. Adjust A3 so 4.5 MC occurs at center of crossover lines as per figure 2. SLIGHTLY retouch A2 for maximum amplitude and straightness of crossover lines.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of R18 and C32. Connect positive lead to B-. Unsolder one end of the oscillator cathode choke (L7) to disable the local oscillator and prevent erroneous indications.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.005MFD	High side to pin 1 (Grid) of 6AU6 (V3). Low side to B-.	24MC (10MC SWP)	21.9MC (maximum output)	Any	Vert. Amp. to Point E. Low side to B-.	A4	Adjust for MINIMUM marker indication at the 21.9MC point on response curve.
4.	.005MFD	"	"	27.3MC	"	"	A5	Adjust for MINIMUM marker indication at the 27.3MC point on response curve.
5.	.005MFD	"	"	26.6MC	"	"	A6	Adjust A6 to place 26.6MC marker at 40% on high frequency slope on response curve as per figure 3.
6.	.005MFD	"	"	22.7MC	"	"	A7	Adjust A7 to place 22.7MC marker at 40% on low frequency slope on response curve as per figure 3.
7.	.005MFD	"	"	26.6MC 22.7MC	"	"	A8	Adjust for flat top and symmetrical response similar to figure 3.
8.	.005MFD	High side to pin 2 (Grid) of 12AT7 (V2). Low side to B-.	"	21.9MC 22.8MC 26.4MC 27.3MC	"	"	A9, A10	Adjust both cores simultaneously from fully out to obtain response curve similar to figure 4 with markers as shown.
9.	.005MFD	"	"	"	"	"	A11	Adjust for flat top curve similar to figure 4.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to pin 1 (Grid) of 6AH6 (V7). Low side to B-.	Not used	4.5MC (400 % Mod.)	Any	Vert. Amp. to Pin 11 (cathode) of picture tube. Low side to B-.	A12	Adjust for MINIMUM 400 % indication on scope. After alignment is completed, tune in a test pattern and adjust A12 for maximum vertical wedge definition.

RF AND ANTENNA ALIGNMENT

The RF and Mixer Circuits of this receiver have been pre-set at the factory and are very stable. Alignment of these circuits should not be attempted unless they are definitely known to be out of alignment.
Remove bias battery and short AGC line to B-.
It should be noted that the antenna coils are adjusted at the video carrier frequency, and the RF coils are adjusted to the sound carrier frequency for each of the low band channels.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	195MC (10MC SWP)	193.25MC 197.75MC	10	Vert. Amp. thru 150KΩ to point D. Low side to B-.	A13	Adjust for response curve similar to figure 5.
12.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all high band channels for response curve similar to figure 5. If necessary expand or compress coil turns A14. If A14 is adjusted repeat steps 11 and 12.
			207MC (10MC SWP)	205.25MC 209.75MC	12			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
13.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A15, A16	Expand or compress coil turns for response curve similar to figure 6. SEE INSTRUCTIONS ABOVE.
			79MC (10MC SWP)	77.25MC 81.75MC	5		A17, A18	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A19, A20	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A21, A22	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A23, A24	

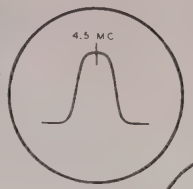


FIG. 1

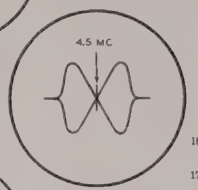


FIG. 2

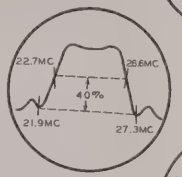


FIG. 3

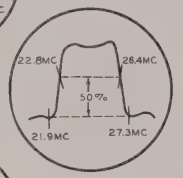


FIG. 4

FIG. 5

FIG. 6

FIG. 7

FIG. 8

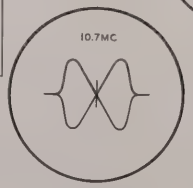


FIG. 9

TV ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Resolder cathode choke (L7). Remove the short from AGC line and reconnect 3 volt bias as outlined under video IF Alignment.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	195MC (10MC SWP)	197.75MC	10	Vert. Amp. to Point E. Low side to B-.	A25	Adjust to place sound marker as shown in figure 7.
15.	"	"	213MC (10MC SWP)	215.75MC	13	"		Check to see that sound marker can be placed as shown in figure 7 with the fine tuning control no more than 22 1/2 degrees either side of mid position. If not, expand or compress coil turns A26. If A26 is changed repeat steps 14 and 15. NOTE: In late model receivers the sound markers for channels 11, 12, and 13 will fall on the same side of the pattern (Fig. 7) as the low frequency channel sound markers.
			207MC (10MC SWP)	209.75MC	12			
			201MC (10MC SWP)	203.75MC	11			
			189MC (10MC SWP)	191.75MC	9			
			183MC (10MC SWP)	185.75MC	8			
			177MC (10MC SWP)	179.75MC	7			
16.	"	"	85MC (10MC SWP)	87.75MC	6	"	A27	Expand or compress coil turns to place sound marker as shown in figure 7.
17.	"	"	79MC (10MC SWP)	81.75MC	5	"	A28	"
18.	"	"	69MC (10MC SWP)	71.75MC	4	"	A29	"
19.	"	"	63MC (10MC SWP)	65.75MC	3	"	A30	"
20.	"	"	57MC (10MC SWP)	59.75MC	2	"	A31	"

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and chassis.
To set pointer turn tuning cap fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
21	.1MFD	High side to pin 7 (Grid) of 12BA7 (V22). Low side to chassis.	455KC (400 % Mod.)	AM (CW)	Tuning gang fully open	Across voice coil	A32, A33, A34, A35	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
22	.1MFD	"	1620KC	"	"	"	A36	"
23		Loop	1400KC	"	1400KC	"	A37	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT

Use frequency modulated signal with 60 % modulation and 450KC sweep. Use 120 % sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
24	.01MFD	High side to pin 1 (Grid) of 12BA6 (V23). Low side to chassis.	10.7MC (450KC Sweep)	FM (CCW)	Tuning gang fully open	Vert. Amp. to Point E. Low side to chassis.	A38, A39, A40	Disconnect stabilizer capacitor C107. Adjust for maximum amplitude and symmetry as per figure 8.
25	.01MFD	High side to pin 7 (Grid) of 12BA7 (V22). Low side to chassis.	"	"	"	"	A41, A42	"
26	.01MFD	"	"	"	"	Vert. Amp. to Point E. Low side to chassis.	A43	Reconnect capacitor C107. Adjust A43 so 10.7MC occurs at center of crossover lines as per figure 9. SLIGHTLY retouch A38 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
27	300Ω carbon res.	High side thru 300Ω to "FM antenna" terminal No. 2 (remove short between terminals 2 and 3). Low side to terminal 1.	105MC (Unmod.)	FM	105MC	DC Probe to Point E. Common to chassis.	A44	Adjust for maximum deflection.
28	Turn tuning gang fully closed. Turn adjustment A45 counter-clockwise until the tuning core is at the bottom of pipe, then turn A45 two turns clockwise.							
29	300Ω carbon res.	High side thru 300Ω to "FM antenna" terminal 2. Low side to terminal 1.	105MC	FM	Tune for max. deflection	DC Probe to Point E. Common to chassis.	A46	Adjust for maximum deflection.
30	"	"	90MC	"	"	"		Check A46 to see which direction of rotation increases deflection. If clockwise rotation is required turn the core nut A45 1/2 turn clockwise. If counter-clockwise rotation is required turn A45 1/2 turn counter-clockwise. Repeat steps 29 and 30 until no further improvement can be made.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-1.2VDC	.6VDC	6.3VAC	0V.	240VDC	145VDC	.4VDC		
V 2	12AT7	160VDC	-.3VDC	4.6VDC	0V.	0V.	240VDC	§-7.2VDC	.1VDC	6.3VAC
V 3	6AU6	-1.6VDC	.4VDC	0V.	6.3VAC	250VDC	145VDC	1VDC		
V 4	6AU6	-.1VDC	.4VDC	0V.	6.3VAC	250VDC	155VDC	1VDC		
V 5	6AG5	2.7VDC	3.8VDC	0V.	6.3VAC	155VDC	155VDC	3.8VDC		
V 6	6AL5	.1VDC	0V.	0V.	6.3VAC	0V.	0V.	3.8VDC		
V 7	6AH6	2.5VDC	16VDC	0V.	6.3VAC	225VDC	195VDC	16VDC		
V 8	6AU6	.1VDC	1.3VDC	0V.	6.3VAC	100VDC	100VDC	1.3VDC		
V 9	6AL5	.7VDC	-1VDC	0V.	6.3VAC	-.3VDC	0V.	.3VDC		
V 10	6J5	0V.	0V.	17VDC	0V.	-.6VDC	0V.	6.3VAC	0V.	
V 11	6V6GT	0V.	6.3VAC	200VDC	215VDC	0V.	0V.	0V.	11VDC	
V 12	6SN7GT	-2VDC	15VDC	0V.	5VDC	90VDC	10VDC	0V.	6.3VAC	
V 13	6J5	0V.	0V.	145VDC 14VDC	0V.	-13VDC -18VDC	0V.	6.3VAC	0V.	
V 14	25L6GT	0V.	0V.	250VDC	250VDC	0V.	0V.	25VAC	17VDC 38VDC	
V 15	6AL5	.7VDC	.7VDC	0V.	6.3VAC	8.6VDC	0V.	-6.7VDC		
V 16	6SN7GT	5.7VDC 2.8VDC	145VDC	8VDC	0V.	210VDC	7.2VDC	0V.	6.3VAC	
V 17	■BQ6GT	145VDC	6.3VAC	0V.	160VDC	-23VDC	0V.	0V.	4.5VDC	TOP CAP *
V 18	6W4GT	0V.	0V.	*	0V.	260VDC	0V.	*	*	
V 19	1B3GT	* DO NOT MEASURE.								
V 20	16TP4A	6.3VAC	0V.	PIN 10 260VDC	PIN 11 110VDC 0V.	PIN 12 0V.				

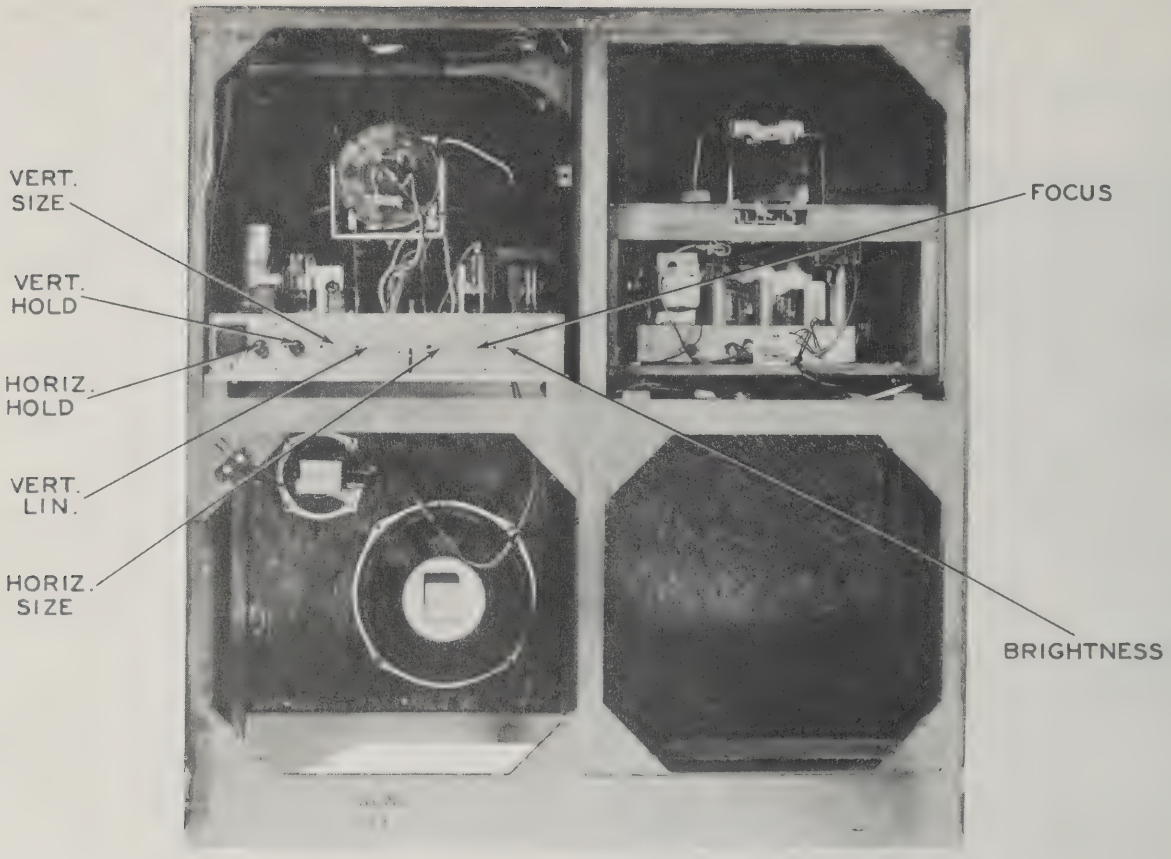
FOCUS CONTROL IN FULLY COUNTERCLOCKWISE POSITION
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.5 Meg.	100Ω	.1Ω	0Ω	†3.9KΩ	†3.3KΩ	33Ω		
V 2	12AT7	†2.3KΩ	5.6KΩ	1000Ω	0Ω	0Ω	†1000Ω	10KΩ	2Ω	.1Ω
V 3	6AU6	1.5 Meg.	33Ω	0Ω	.1Ω	†240Ω	†2.5KΩ	80Ω		
V 4	6AU6	1.5 Meg.	33Ω	0Ω	.1Ω	†240Ω	†1.5KΩ	80Ω		
V 5	6AG5	220Ω	300Ω	0Ω	.1Ω	†1.5KΩ	†1.5KΩ	300Ω		
V 6	6AL5	14Ω	Inf.	0Ω	.1Ω	Inf.	470KΩ	5.6KΩ		
V 7	6AH6	1 Meg.	2000Ω	0Ω	.1Ω	†4.7KΩ	†33KΩ	2000Ω		
V 8	6AU6	1.2Ω	150Ω	0Ω	.1Ω	†3KΩ	†3KΩ	150Ω		
V 9	6AL5	6.8KΩ	6.8KΩ	0Ω	.1Ω	1 Meg.	470KΩ	1 Meg.		
V 10	6J5	470KΩ	0Ω	†470KΩ	14Ω	4.7 Meg.	0Ω	.1Ω	0Ω	
V 11	6V6GT	Inf.	.1Ω	†1.3KΩ	†1000Ω	470KΩ	0Ω	0Ω	330Ω	
V 12	6SN7GT	1 Meg.	†1 Meg.	0Ω	24KΩ	†6.7KΩ	3.2KΩ	0Ω	.1Ω	
V 13	6J5	470KΩ	0Ω	†470KΩ †5 Meg.	2.7KΩ	680KΩ	1 Meg.	.1Ω	0Ω	
V 14	25L6GT	150KΩ	0Ω	†650Ω	†650Ω	3.3 Meg.	Inf.	.1Ω	5.5KΩ 470Ω	
V 15	6AL5	15KΩ	15KΩ	0Ω	.1Ω	4.8 Meg.	470KΩ	4.8 Meg.		
V 16	6SN7GT	120KΩ 220KΩ	†68KΩ	1.5KΩ	9.4 Meg.	†6.8KΩ	1000Ω	0Ω	.1Ω	
V 17	6BQ6GT	60KΩ	.1Ω	Inf.	†6.8KΩ	470KΩ	Inf.	0Ω	47Ω	TOP CAP ▲18Ω
V 18	6W4GT	Inf.	Inf.	▲0Ω	Inf.	†42Ω	Inf.	▲.7Ω	▲0Ω	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲200Ω
V 20	16TP4A	.1Ω	2.7KΩ	PIN 10 †42Ω	PIN 11 600KΩ 47KΩ	PIN 12 0Ω				

FOCUS CONTROL IN FULLY COUNTERCLOCKWISE POSITION.
† MEASURED FROM OUTPUT OF M1.
▲ MEASURED FROM PIN 3 OF V18.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern. Turn the Horizontal Hold control to center of its range.

Adjust Horizontal Frequency slug (B1) to the center of the range over which the picture synchronizes horizontally.

Adjust the Horizontal Size lever until picture fills the mask horizontally.

DISASSEMBLY INSTRUCTIONS

TV CHASSIS

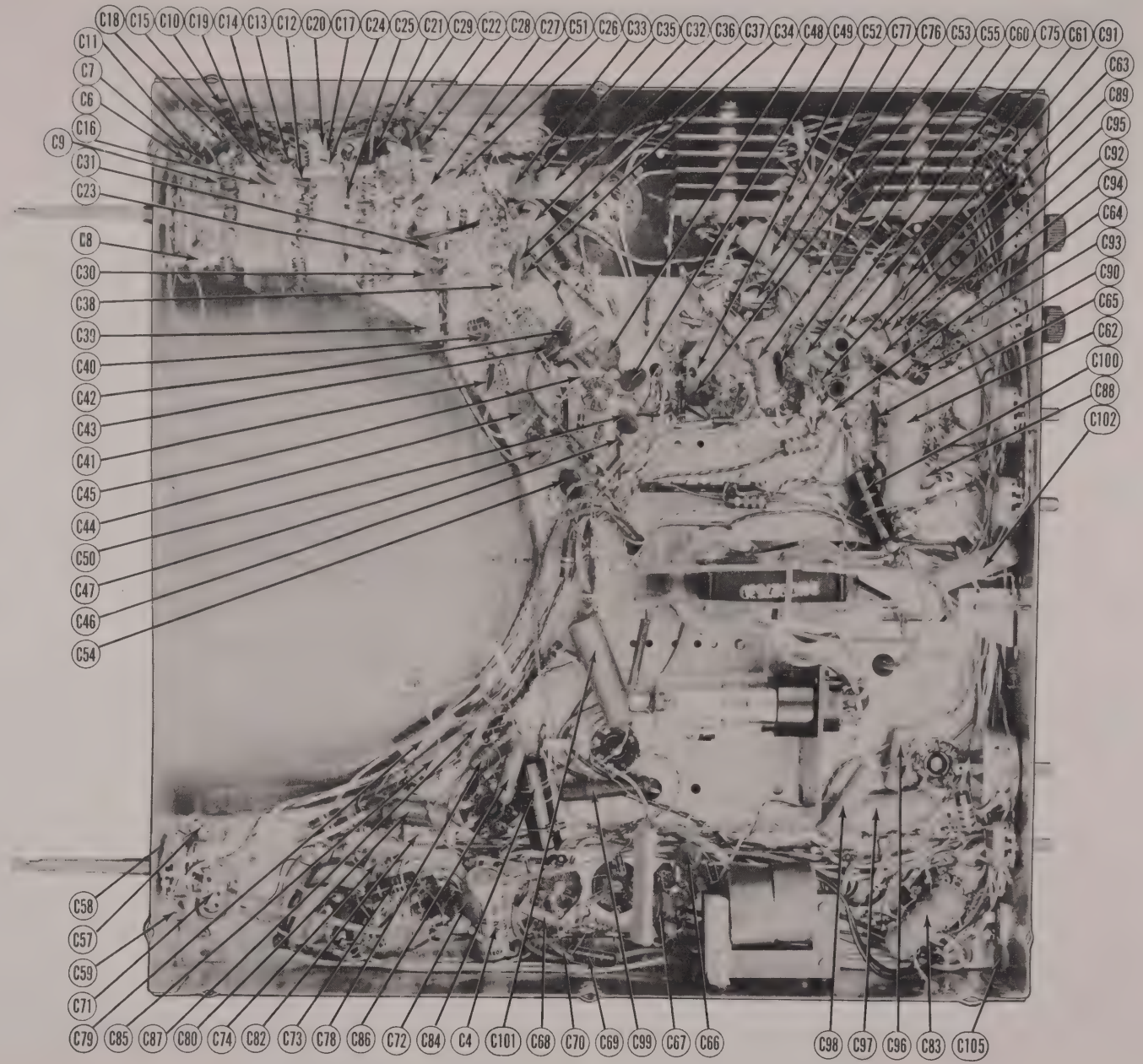
1. Remove four push-on type TV control knobs from front of set.
2. Remove eight screws holding TV rear cover. Remove cover.
3. Remove two screws holding antenna terminal strip to rear of cabinet.
4. Disconnect speaker plug at speaker.
5. Remove six 1/4" hex head screws holding chassis at bottom. Remove chassis.

SPEAKERS

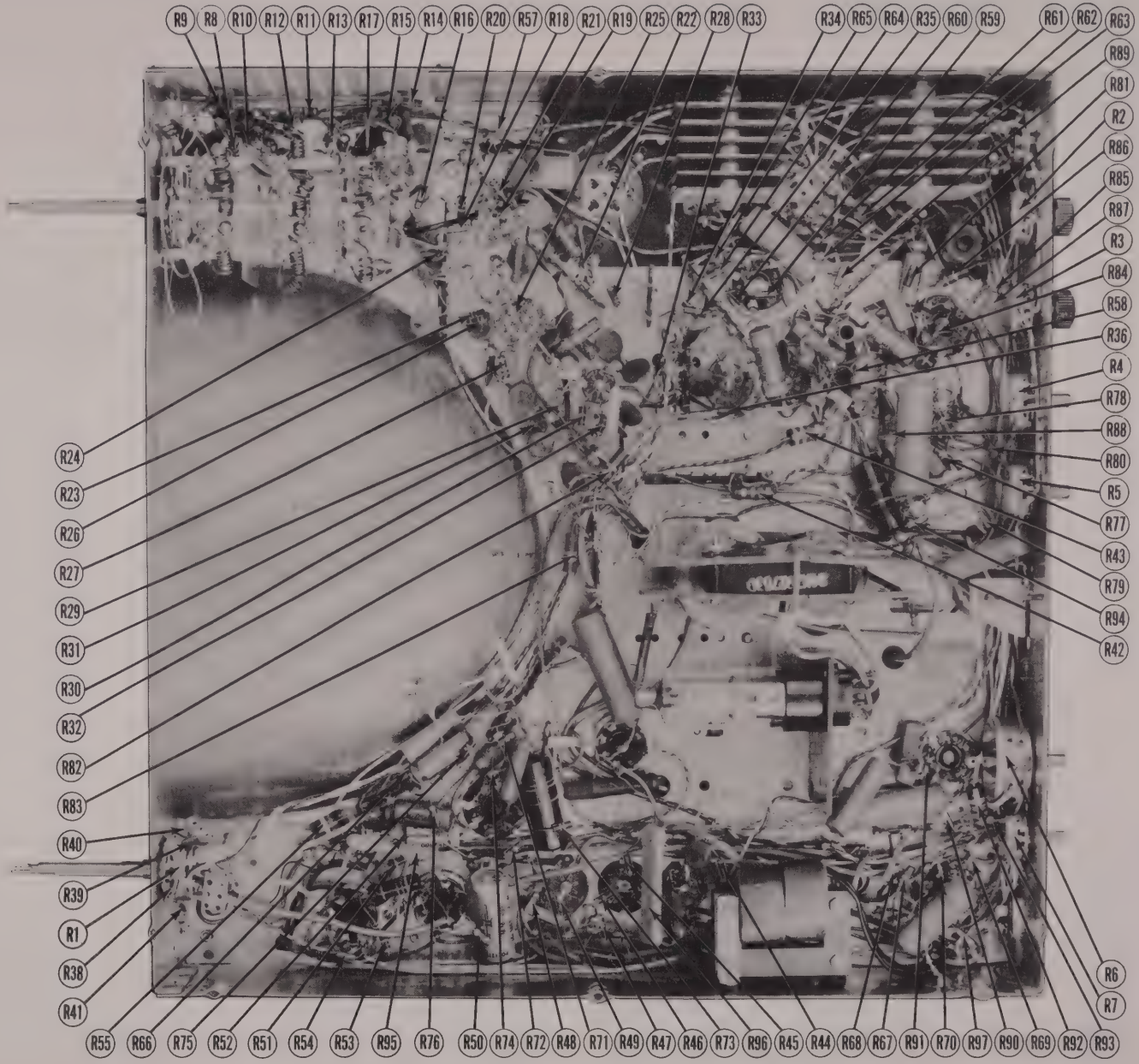
1. Disconnect plugs connecting both speakers.
2. Disconnect radio-phono plugs at large speaker connections.
3. Remove four 5/16" hex nuts holding each speaker. Remove speaker.

RADIO CHASSIS

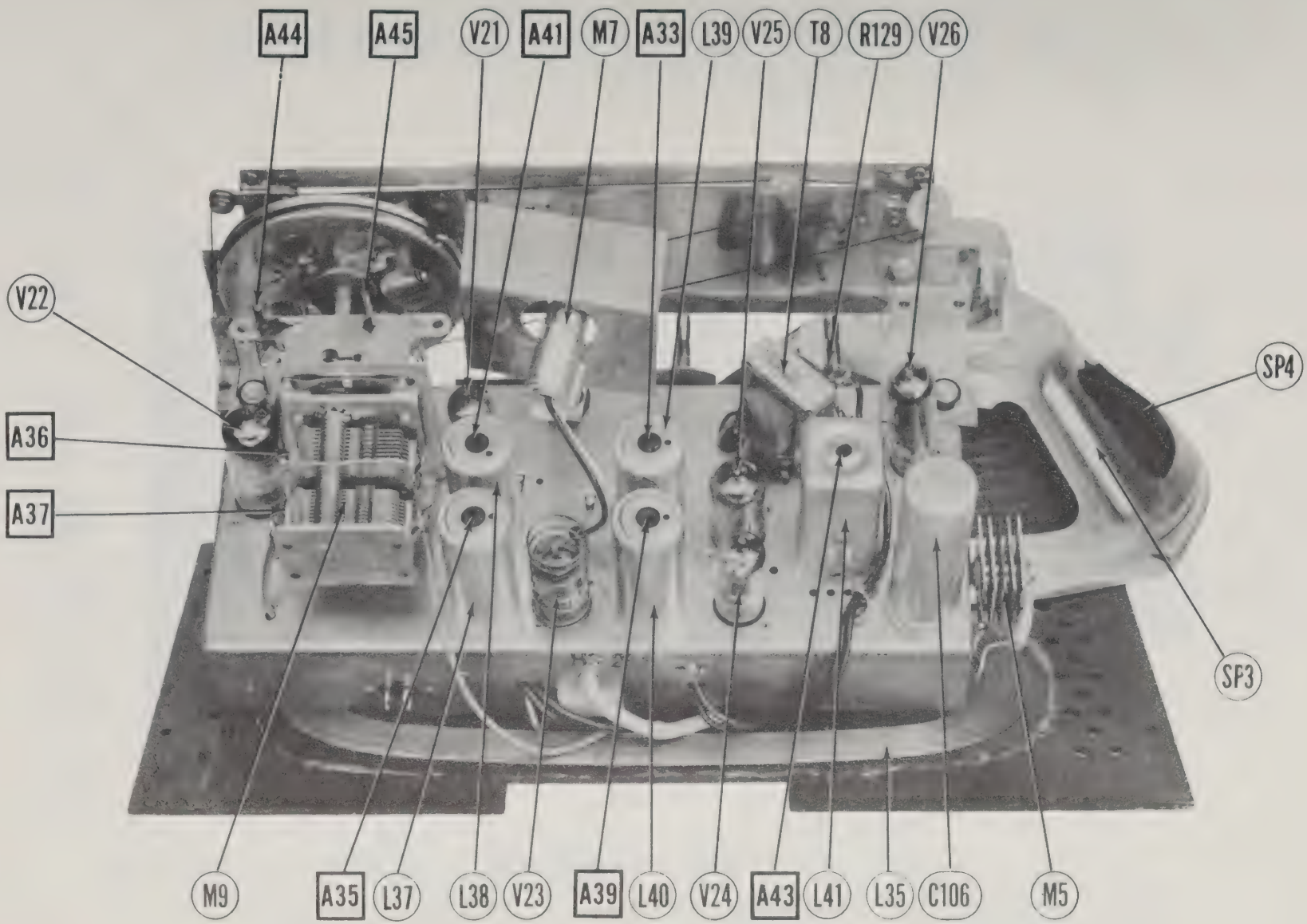
1. Remove four push-on type control knobs from front of set.
2. Remove twelve screws holding rear cover. Remove cover.
3. Remove four screws holding rear cover of radio compartment. Pull cover to rear in order to disconnect power plug.
4. Disconnect loop antenna plug at chassis and remove green lead from loop connection.
5. Remove two 1/4" hex head bolts holding power plug connector to cabinet.
6. Disconnect phono motor power and phono input plugs.
7. Remove three 1/4" hex head screws holding chassis at bottom. Remove chassis from rear.



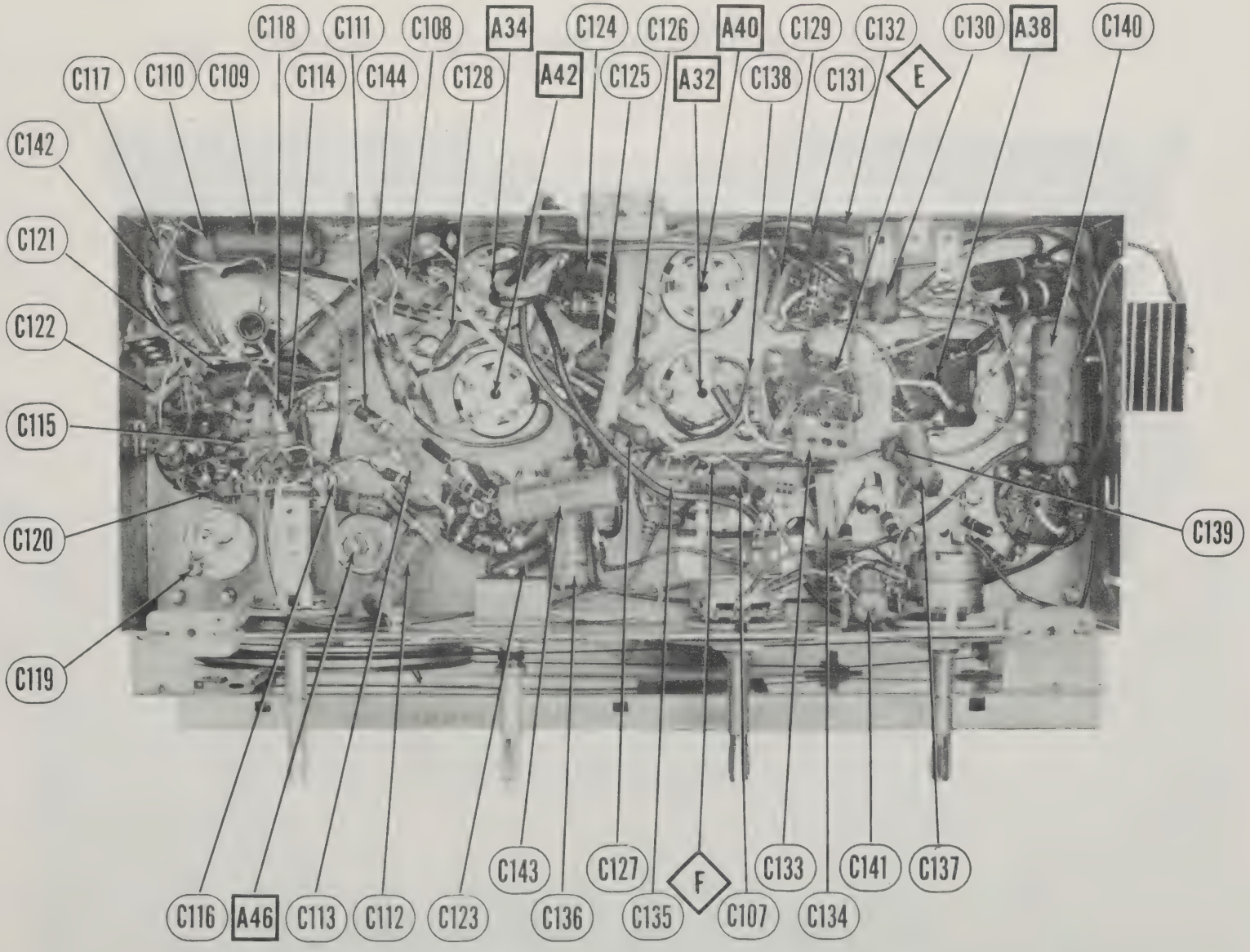
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



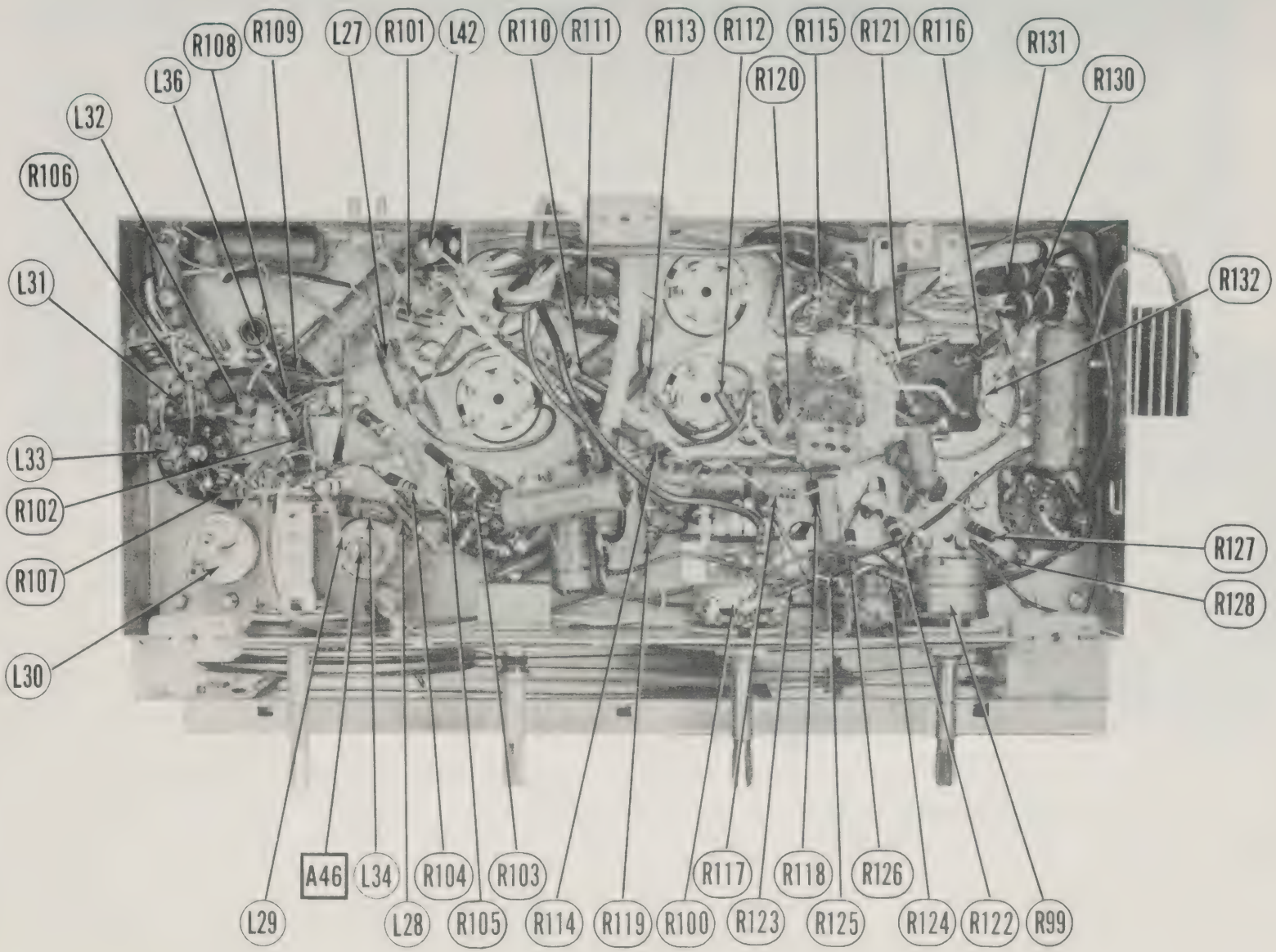
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



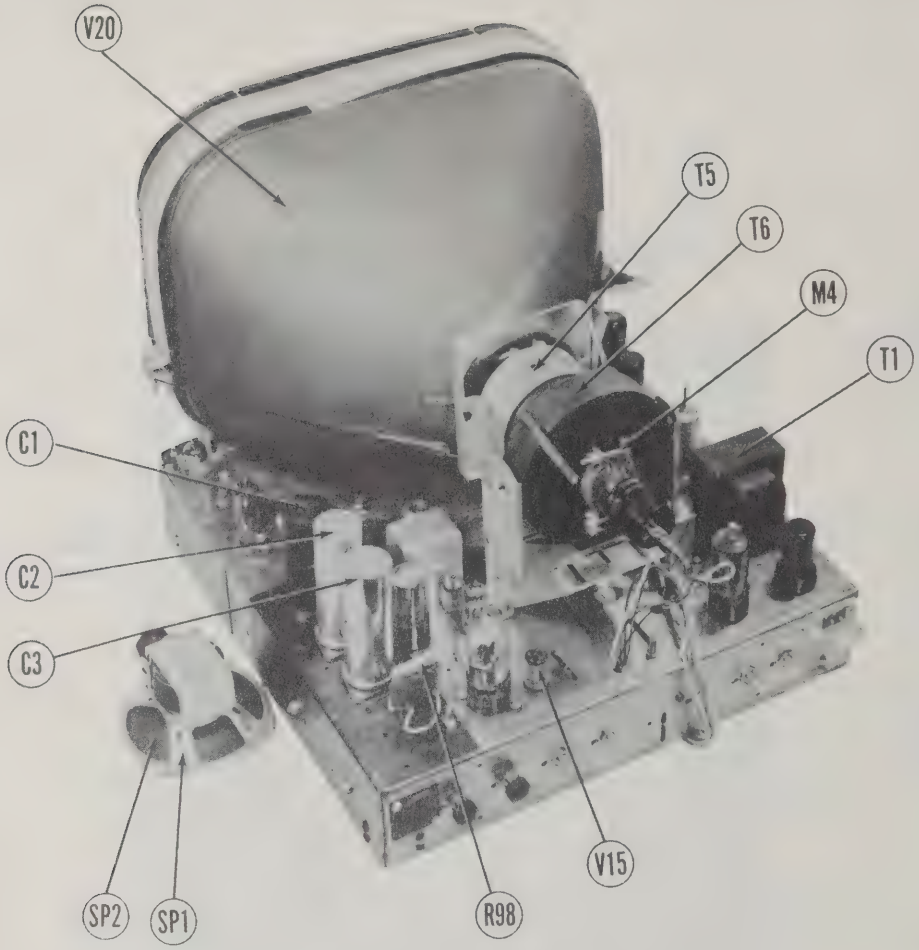
RADIO CHASSIS - TOP VIEW



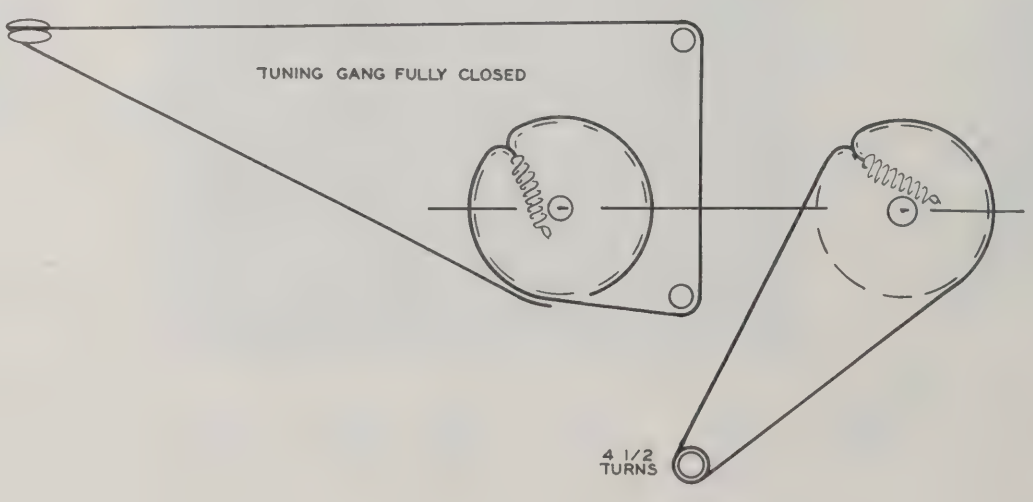
RADIO CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



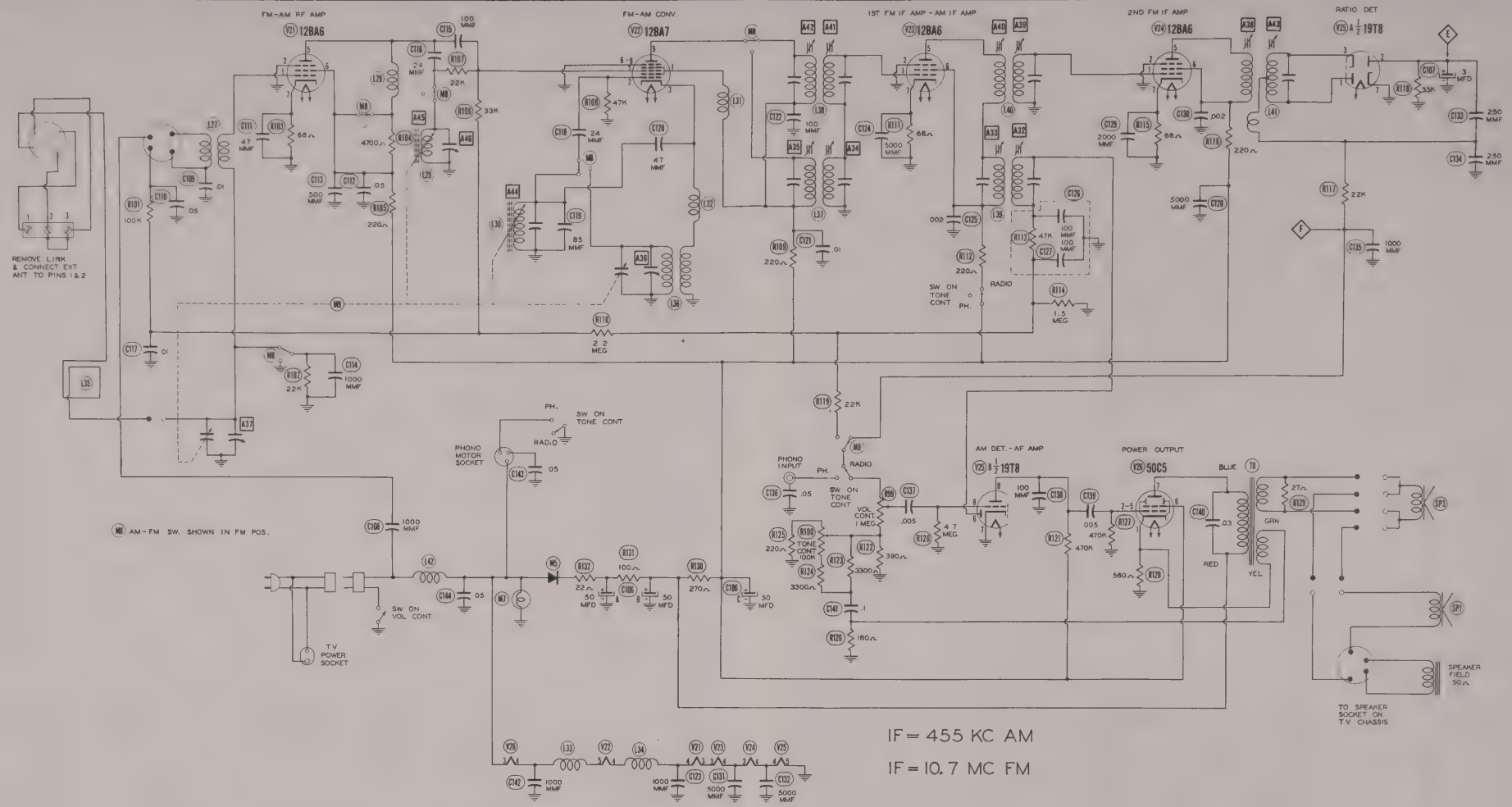
RADIO CHASSIS - BOTTOM VIEW - RESISTOR IDENTIFICATION



TV CHASSIS-TOP VIEW



DIAL CORD STRINGING



VOLTAGE AND RESISTANCE READINGS TAKEN IN "RADIO" POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V21	12BA6	-.1VDC	0V	45VAC	55VAC	100VDC	100VDC	-.9VDC	
#	V21	12BA6	-.2VDC	0V.	45VAC	55VAC	70VDC	100VDC	-.7VDC	
†	V22	12BA7	100VDC	5-5.6VDC	.1VDC	55VAC	67VAC	0V	-.2VDC	0V.	100VDC
#	V22	12BA7	100VDC	5-6.2VDC	.1VDC	55VAC	67VAC	0V.	-.1VDC	0V.	100VDC
†	V23	12BA6	0V.	0V.	45VAC	32VAC	100VDC	100VDC	1VDC		
#	V23	12BA6	0V.	0V	45VAC	32VAC	100VDC	100VDC	1VDC		
†	V24	12BA6	0V.	0V.	32VAC	19VAC	100VDC	100VDC	1VDC		
†	V25	19T8	-.4VDC	-1.6VDC	-.4VDC	19VAC	0V	-.7VDC	0V.	-.7VDC	48VDC
#	V25	19T8	-.7VDC	-1.2VDC	-.7VDC	18VAC	0V.	-.7VDC	0V.	-.7VDC	48VDC
*	V26	50C5	7VDC	0V.	117VAC	67VAC	0V.	105VDC	115VDC		

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V21	12BA6	22KΩ	0Ω	37Ω	44Ω	†600Ω	†600Ω	68Ω	
#	V21	12BA6	2.6 Meg.	0Ω	37Ω	44Ω	†5.3KΩ	†600Ω	68Ω	
†	V22	12BA7	†600Ω	47KΩ	2.3Ω	46Ω	54Ω	0Ω	22KΩ	0Ω	†600Ω
#	V22	12BA7	†600Ω	47KΩ	2.3Ω	46Ω	54Ω	0Ω	2.5 Meg	0Ω	†600Ω
†	V23	12BA6	15.8Ω	0Ω	37Ω	27Ω	†600Ω	†600Ω	68Ω		
#	V23	12BA6	15.8Ω	0Ω	37Ω	27Ω	†600Ω	†600Ω	68Ω		
†	V24	12BA6	.8Ω	0Ω	27Ω	17Ω	†600Ω	†600Ω	68Ω		
†	V25	19T8	1 Meg.	33KΩ	1 Meg.	17Ω	0Ω	1.5Meg	0Ω	4.7 Meg.	1470KΩ
#	V25	19T8	Inf.	33KΩ	Inf.	17Ω	0Ω	700KΩ	0Ω	4.7 Meg.	1470KΩ
#	V26	50C5	150Ω	470KΩ	80Ω	56Ω	470KΩ	†390Ω	†300Ω		

† TAKEN IN "FM" POSITION
# TAKEN IN "AM" POSITION.

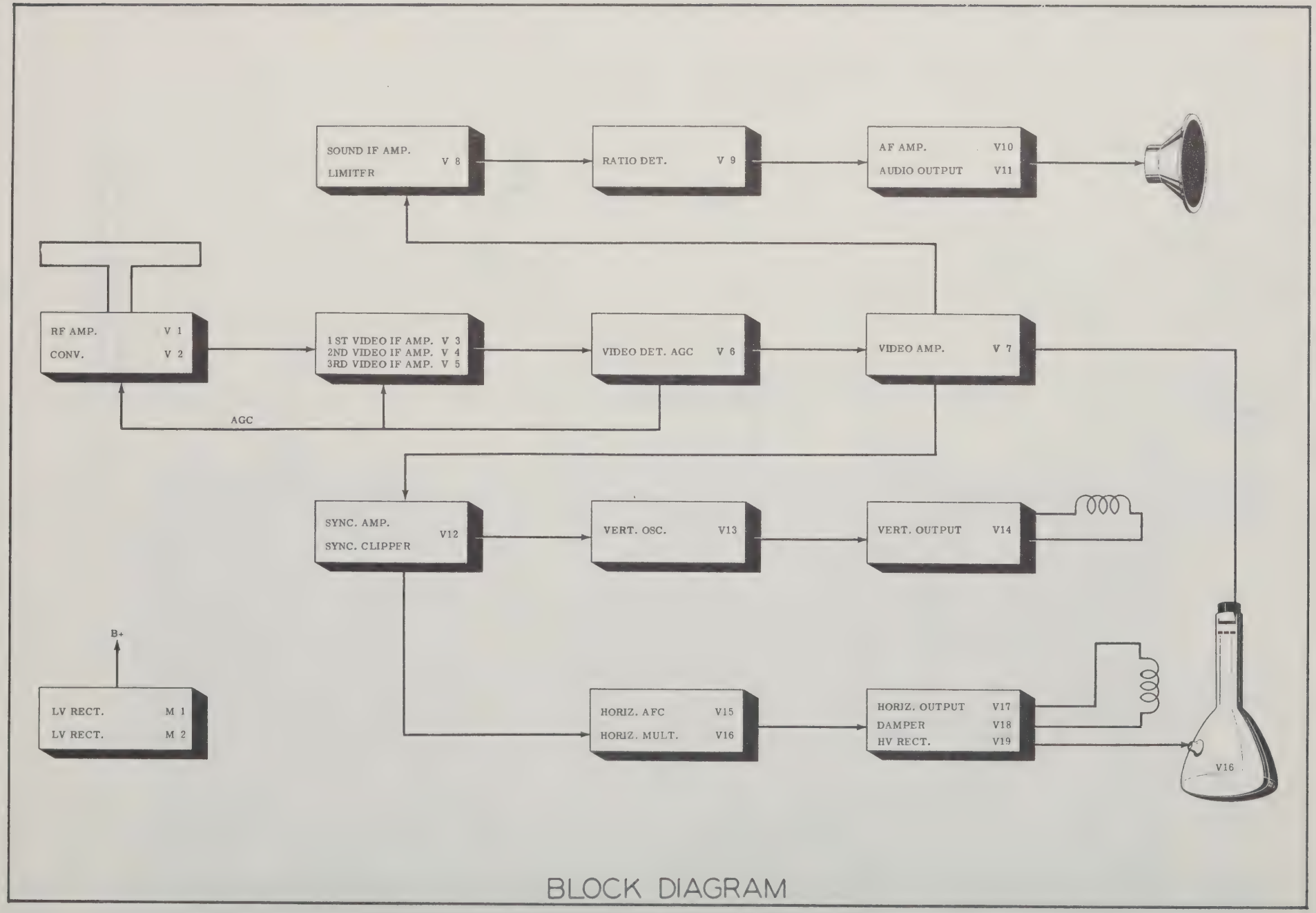
† MEASURED FROM OUTPUT OF M5.

1 DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2 Socket connections are shown as bottom views
3 Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5 Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6 Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950

MOTOROLA MODELS 16F1, 16K2, 16T1
(Ch. TS-60, TS-74 & Radio Ch. HS-234)

RADIO SCHEMATIC



BLOCK DIAGRAM

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6CB6	6CB6	7B	
V2	Converter	12AT7	12AT7	9A	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AG5	6AG5	7BD	
V6	Video Det. -AGC	6AL5	6AL5	6BT	
V7	Video Amp.	6AH6	6AH6	7BK	
V8	Sound IF Amp. - Limiter	6AU6	6AU6	7BK	
V9	Ratio Det.	6AL5	6AL5	6BT	
V10A	AF Amp.	6J5	6J5	6Q	
B	AF Amp.	6J5GT	6J5GT	6Q	
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	Sync. Amp. -Sync. Clipper	6SN7GT	6SN7GT	8BD	
V13A	Vert. Osc.	6J5	6J5	6Q	
B	Vert. Osc.	6J5GT	6J5GT	6Q	
V14	Vert. Output	25L6GT	25L6GT	7AC	
V15	Hor. AFC	6AL5	6AL5	6BT	
V16	Hor. Mult.	6SN7GT	6SN7GT	8BD	
V17	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rect.	1B3GT	1B3GT	3C	
V20A	Picture Tube	16BP4A	16BP4A	12D	Used in models 16F1, 16T1
B	Picture Tube	16GP4A	16GP4A	12D	Used in model 16K2

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	300	150	23B791692	AFH60D		UPE300 15			Voltage Doubler Cap.
C2A	200	300	23B791721	AFH40G124F		UPE14CJ			▲ Filter
B	60	250				18			■ Filter
C	20	250							▲ Decoupling
C3A	200	300	23B791741	AFH40G4F4A		UP14DJ11			▲ Filter
B	20	250		20B		54			■ V. Amp. Screen Byp.
C	20	25							▲ Bias Filter
D	100	50							Vert. Output Cath. Byp.
C4	10	50	23A90205	PRS50/10		BR105		TVA-14	Stabilizing Cap.
C5	10	50	23A90205	PRS50/10		BR105		TVA-14	AF Amp. Cath. Byp. †
C6	220		21K77375	GP220M	D6-221		GP2K-220		Ant. Coupling
C7	220		21K77375	GP220M	D6-221		GP2K-220		Ant. Coupling
C8	8		21K478234	CI8FNPO			NPOK-8.2		Fixed Trimmer
C9	220		21K77375	GP220M	D6-221		GP2K-220		RF Coupling
C10	10000		21K482726	BPD-10	D6-103		811-01	36C1	AGC Filter
C11	20		21K490799	C120KN750	DN-20		N750K-20		RF Cath. Byp.
C12	1500		21A470790	GP1500M	D6-152		811-0015	29C3	RF Cath. Byp.
C13	1500		21A470790	GP1500M	D6-152		811-0015	29C3	RF Screen Byp.
C14	10000		21K482726	BPD-10	D6-103		811-01	36C1	RF Screen Byp.
C15	10000		21K482726	BPD-10	D6-103		811-01	36C1	RF Plate Decoup.
C16	10000		21K482726	BPD-10	D6-103		811-01	36C1	RF Plate Decoup.
C17	.5-3		1X790189		829-3				Variable Trimmer
C18	220		21K77375	GP220M	D6-221		GP2K-220		RF Filament Byp.
C19	220		21K77375	GP220M	D6-221		GP2K-220		RF Filament Byp.
C20	8		21K478234	CI8DNPO			NPOK-8.2		RF Coup.
C21	1500		21A470790	GP1500M	D6-152		811-0015	29C3	Mixer Cath. Byp.
C22	220		21K77375	GP220M	D6-221		GP2K-220		Mixer Fil. Byp.
C23	220		21K77375	GP220M	D6-221		GP2K-220		Mixer Fil. Byp.
C24	2		21K478280	CI2DN1400			N1400K-2		Osc. Coupling
C25	20		21K470322	C120KN750	DN-20		N750K-20		Osc. Grid Cap.
C26	.5-3		1X790189		829-3				Variable Trimmer
C27	2		21K478280	CI2DN1400			N1400K-2		Osc. Feedback
C28	5000		21A470789	BPD-5	D6-502		811-005	29C1	Osc. Plate Byp.
C29	5000		21A470789	BPD-5	D6-502		811-005	29C1	RF Bypass
C30	1500		21A470790	GP1500M	D6-152		811-0015	29C3	Mixer Plate Decoup.
C31	1500		21A470790	GP1500M	D6-152		811-0015	29C3	AGC Filter
C32	.25	100	8R9810	P488-25		GT2P25		TC-2	AGC Filter
C33	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	1st V. IF Cath. Byp.
C34	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	1st V. IF Screen Byp.
C35	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	1st V. IF Fil. Byp.
C36	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	1st V. IF Plate Dec.
C37	220		21K77375	GP220M	D6-221	5W5T25	GP2K-220	1FM-325	IF Coupling
C38	30		21K470329	CI30KN150			N150K-30		Fixed Trimmer
C39	10000		21K482726	BPD-10	D6-103	PTE4S1	811-01	36C1	AGC Filter
C40	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	2nd V. IF Cath. Byp.
C41	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	2nd V. IF Screen Byp.
C42	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	2nd V. IF Fil. Byp.
C43	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	2nd V. IF Plate Dec.
C44	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	IF Coupling
C45	30		21K470329	CI30KN150			N150K-30		Fixed Trimmer
C46	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Cath. Byp.
C47	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Cath. Byp.
C48	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	3rd V. IF Fil. Byp.
C49	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	3rd V. IF Fil. Byp.
C50	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Dec.
C51	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	RF Bypass
C52	6		21K470324	GP5K	D2-6.8	5W5Q1	NPOK-68	MS-41	V. Diode Filter
C53	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	V. Det. Fil. Byp.
C54	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	Filament Bypass
C55	.1	100	8R9854	P288-1		PTE4P1		TM-1	Video Coupling
C56	.01	200	8R9801	P488-01	D6-103	PTE4S1	811-01	TM-12	V. Amp. Cath. Byp. †
C57	1000		21K780599	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	V. Amp. Cath. Byp.
C58	1000		21K780599	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	V. Amp. Cath. Byp.
C59	100		21B77286	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	V. Amp. Cath. Byp.
C60	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	V. Amp. Fil. Byp.
C61	30		21K470329	CI30KN150			N150K-30		Fixed Trimmer
C62	.1	600	8R9874	P688-1		PTE6P1		TM-1	Video Coupling
C63	2.2		21A478274		D2-2.2				S. IF Coupling

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C64	60		21K790683	C160KN750	DN-62		N750L-60		Fixed Trimmer
C65	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	RF Bypass
C66	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Cath. Byp.
C67	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	S. IF Decoupling
C68	500	500	21R6590	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Diode Load Cap.
C69	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	De-emphasis
C70	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	RF Bypass
C71	500	500	21R6590	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Tone Comp.
C72	10000		21K482726	BPD-10	D6-103	PTE4S1	811-01	36C1	Audio Coupling
C73	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	TM-25	Audio Coupling
C74	68	500	21R6650	1468-0000075	D6-680	5W5Q7	GP1K-68	MS-47	Tone Compensation
C75	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	TM-25	Sync. Coupling
C76	30		21K470322	GP30M	D6-200	5W5Q2	GP1K-20	MS-42	1st Sync. Clipper Grid
C77	.05	600	8R9873	P688-05		PTE6S5		TM-15	Sync. Coupling
C78	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	TM-25	Integrator Net.
C79	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	TM-25	Integrator Net.
C80	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	TM-25	Vert. Sync. Coupling
C81	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	RF Bypass
C82	.006	600	8K790026	P688-006		PTE6D6		TM-26	Vert. MV Feedback
C83	.05	600	8R9873	P688-05		PTE6S5		TM-15	Vert. Discharge
C84	.15	400	8R9875	P488-15					Vert. Sweep Coup.
C85	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	TM-25	Vert. Sweep Coup.
C86	.002	600	8R9867	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Voltage Divider
C87	.002	600	8R9867	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Integrator Net.
C88	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	TM-11	Hor. Sync. Coup.
C89	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	TM-11	Hor. Sync. Coup.
C90	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	TM-25	AFC Filter
C91	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	AFC Filter
C92	.01	600	8R9870	P688-01	D6-103	PTE6S1	811-01	TM-11	AFC Filter
C93	270		21K400037	GP270M	D6-271	5W5T25	GP2K-270	1FM-325	Hor. MV Feedback
C94	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	TM-25	Fixed Trimmer
C95	680	500	21R2741		D6-681	1W5T7	GP2K-680	1FM-37	Hor. Discharge
C96	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	TM-25	Hor. Sweep Coupling
C97	.1	600	8R9874	P688-1		PTE6P1		TM-1	Hor. Output Screen Byp.
C98	.1	100	8R9854	P288-1		PTE4P1		TM-1	Hor. Output Cath. Byp.
C99	100	3000	21K792438						Damper Bypass
C100	.1	400	8R9874	P488-1		PTE4P1		TM-1	Hor. Sweep Coup.
C101	.1	600	8R9874	P688-1		PTE6P1		TM-1	Hor. Sweep Coup.
C102	.03	600	8R9872	P688-03		PTE6S3		TM-13	Fixed Trimmer
C103	500	20000							HV Filter *
C104	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	RF Bypass *
C105	1500		21A470790	GP1500M	D6-152	1W5D15	811-0015	29C3	Line Filter

* Used in chassis TS-74 only.
† Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2000Ω	½	18A791705				Contrast control-panel tapped @ 1500Ω - 1750Ω
B	1 Meg.	½					Volume control and switch-rear
R2A	100KΩ	½	18A791574	Q11-128	AM-49-8	AN-40	Horiz. hold control
B	Shaft		Not Req.	Not Req.	RS-2	AK-1	Attach to R2A per instructions
R3A	1 Meg.	½	18A90147	Q11-137	AM-61-8	AN-69	Vert. hold control
B	Shaft		Not Req.	Not Req.	RS-2	AK-1	Attach to R3A per instructions
R4A	5 Meg.	½	18A90145	Q11-141	AM-85-8	AN-87	Vert. size control
B	Shaft		Not Req.	Not Req.	RS-2	AK-1	Attach to R4A per instructions
R5A	5000Ω	½	18A791132	Q11-114	AM-19-8	AN-10	Vert. linearity control
B	Shaft		Not Req.	Not Req.	RS-2	AK-1	Attach to R5A per instructions
R6	2000Ω	4	18A790162		10-2000	SVP-998	Focus control-wire wound
R7A	1 Meg.	½	18A90147	Q11-137	AM-61-8	AN-69	Brightness control
B	Shaft		Not Req.	Not Req.	RS-2	AK-1	Attach to R7A per instructions

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R8	22KΩ	½	6R6397		RF Choke Shunt
R9	47KΩ	½	6R6048		AGC Network
R10	56Ω	½	6R5614		RF Amp. Cathode
R11	33Ω	½	6R2036		RF Amp. Cathode
R12	1000Ω	½	6R6229	BTS-1000	RF Amp. Screen
R13	3900Ω	½	6R5659	BTS-3900	RF Plate Decoupling
R14	5600Ω	½	6R6117		Mixer Grid
R15	1000Ω	½	6R6229	BTS-1000	Mixer Cathode-See Note 1
R16	10KΩ	½	6R6320	BTS-10K	Osc. Grid
R17	1000Ω	½	6R6229	BTS-1000	Osc. Plate
R18	6800Ω	½	6R6428	BTS-6800	1st Video IF Transformer Shunt
R19	47Ω	½	6R5550		1st Video IF Cathode
R20	33Ω	½	6R2036		1st Video IF Cathode
R21	220Ω	½	6R6270		1st Video IF Screen
R22	220Ω	½	6R6270		1st Video IF Plate Decoupling
R23	12KΩ	½	6R6394		2nd Video IF Transformer Shunt
R24	1000Ω	½	6R6229	BTS-1000	AGC Network
R25	47Ω	½	6R5550		2nd Video IF Cathode
R26	33Ω	½	6R2036		2nd Video IF Cathode
R27	220Ω	½	6R6270		2nd Video IF Screen
R28	220Ω	½	6R6270		2nd Video IF Plate Decoupling
R29	6800Ω 20%	½	6R6428	BTS-6800	3rd Video IF Transformer Shunt
R30	82Ω	½	6R2035		3rd Video IF Cathode
R31	220Ω	½	6R6270		3rd Video IF Cathode
R32	220Ω	½	6R6270		3rd Video IF Decoupling
R33	5600Ω	½	6R6117	BTS-5600	Video Det. Diode Load
R34	100KΩ	½	6R6031	BTS-100K	Series Test Point
R35	1.5 Meg.	½	6R6460	BTS-1.5 Meg.	AGC Network
R36	1 Meg.	½	6R6004	BTS-1 Meg.	Video Amp. Grid
R37	33Ω	½	6R2036		Video Amp. Cathode-See Note 2
R38	47Ω	½	6R5550		Contrast Control Shunt
R39	120Ω	½	6R5551		Video Amp. Cathode
R40	120Ω	½	6R5551		Video Amp. Cathode

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R41	1500Ω	½	6R6038	BTS-1500	Video Amp. Cathode
R42	33KΩ	1	6R6400	BTA-33K	Video Amp. Screen
R43	4700Ω	2	6R5671	BT-2-4700	Video Amp. Plate
R44	150Ω	½	6R6373		Sound IF Cathode
R45	1000Ω	½	6R6229	BTS-1000	Sound IF Decoupling
R46	180Ω	½	6R5660		Balancing
R47	33KΩ	½	6R6410	BTS-33K	De-emphasis
R48	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R49	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R50	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	AF Amp. Grid
R51	470KΩ	½	6R6377	BTS-470K	AF Amp. Plate
R52	270KΩ	½	6R6414	BTS-270K	AF Feedback
R53	470KΩ	½	6R6377	BTS-470K	Output Grid
R54	330Ω	½	6R6022	BW-½-330	Output Cathode
R55	1000Ω	2	6R3922	BT-2-1000	Decoupling
R56	8200Ω	½	6R2004	BTS-8200	AF Amp. Cathode-See Note 2
R57	1000Ω	½	6R6229	BTS-1000	Voltage Divider
R58	10KΩ	½	6R6320	BTS-10K	Isolation
R59	1 Meg. 20%	½	6R6004	BTS-1 Meg.	Sync. Amp. Grid
R60	1 Meg. 20%	½	6R6004	BTS-1 Meg.	Sync. Amp. Plate
R61	1000Ω	½	6R6229	BTS-1000	Sync. Clipper Cathode
R62	2200Ω	½	6R6069	BTS-2200	Sync. Clipper Cathode
R63	22KΩ	½	6R6397	BTS-22K	Sync. Clipper Grid
R64	4700Ω	½	6R6080	BTS-4700	Sync. Clipper Plate-See Note 3
R65	22KΩ	½	6R6397	BTS-22K	Integrator
R66	8200Ω	½	6R2004	BTS-8200	Integrator
R67	680KΩ	½	6R6475	BTS-680K	Vert. Osc. Grid
R68	470KΩ 20%	½	6R6377	BTS-470K	Vert. Osc. Plate
R69	6800Ω	½	6R6428	BTS-6800	Vert. Peaking
R70	2700Ω	½	6R5577	BTS-2700	Picture Tube Grid
R71	3.3 Meg.	½	6R6497	BTS-3.3 Meg.	Vert. Output Grid
R72	470Ω	½	6R6090	BTS-470	Vert. Output Cathode
R73	150KΩ	½	6R5721	BTS-150K	Voltage Divider
R74	100KΩ	½	6R6031	BTS-100K	Voltage Divider
R75	100KΩ	½	6R6031	BTS-100K	Voltage Divider
R76	47KΩ	½	6R6048	BTS-47K	Integrator
R77	100KΩ	½	6R6031	BTS-100K	Horiz. AFC Diode Load
R78	100KΩ	½	6R6031	BTS-100K	Horiz. AFC Diode Load
R79	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	Horiz. AFC Diode Load
R80	15KΩ	½	6R6477	BTS-15K	Horiz. AFC Filter Network
R81	4.7 Meg. 20%	½	6R6446	BTS-4.7 Meg.	Horiz. AFC Filter Network
R82	150KΩ	1	6R5721	BTA-150K	Feedback Network
R83	150KΩ	1	6R5721	BTA-150K	Feedback Network
R84	470Ω	½	6R6090	BTS-470	Horiz. Mult. Cathode
R85	1000Ω	½	6R6229	BTS-1000	Horiz. Mult. Cathode
R86	6800Ω	1	6R6428	BTA-6800	Horiz. Mult. Plate
R87	120KΩ	½	6R6398	BTS-120K	Horiz. Mult. Grid-See Note 4
R88	68KΩ 20%	½	6R6074	BTS-68K	Horiz. Mult. Plate
R89	1500Ω	½	6R6038	BTS-1500	Horiz. Peaking
R90	470KΩ 20%	½	6R6377	BTS-470K	Horiz. Output Grid
R91	47Ω	1	6R5583	BW-1-47	Horiz. Output Cathode
R92	6800Ω	2	6R5690	BT-2-6800	Horiz. Output Screen
R93	1 Meg.	½	6R6004	BTS-1 Meg.	Voltage Divider
R94	47KΩ	½	6R6048	BTS-47K	Voltage Divider
R95	4000Ω	10	17K790902	AB-4000	Focus Coil Shunt-Wire Wound
R96	2000Ω	10	17K792705	AB-2000	Bleeder-Wire Wound
R97	470KΩ 20%	½	6R6377	BTS-470K	Isolation
R98	5Ω	5	17A700149		Surge Limiter-Wire Wound

Note 1. Some models use 1200Ω resistor in this application.
Note 2. Not used in all models.
Note 3. Some models use 5600Ω resistor in this application.
Note 4. Some models use 150KΩ resistor in this application.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.6A	25VAC @ .3A Tap @ 6.3VAC @ 6.5A	6.3VAC @ .9A		25B79179			
T2	117VAC @ .1A	6.3VAC @ 1.2A				P-6134 ①	P-2944 ①	FO-6 ①

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T3	210Ω	0Ω	25K792753D				Hor. Output Trans.
	Tap @ 2.3Ω, 21.5Ω, 39Ω	SEC. 2 0Ω					
T4	600Ω	11.5Ω	25B792168D	A-8113 ②	A-3035 ①	TSO-5 ②	Vert. Output Trans.
T5A	38Ω		24C700050				Hor. Deflection Coil
B	8Ω						Vert. Deflection Coil
T6	1800Ω		24B792169				Focus Coil

① Drill new mounting holes.
② Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	6700Ω	3.3Ω	300Ω	.4Ω	25P790686	A-3878	A-2931	RO-13	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T8	2400Ω	4Ω	185Ω	.4Ω 24Ω Feedback winding.	25B690805				

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	42Ω	3.3Ω	50K792776		5E42S	
	CONE DIA.	V. C. DIA.				
SP2	4 3/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L1	Ant. Coil	.1Ω		24A790033		
L2	RF Coils	0Ω		24C792764		
L3	RF Choke	8Ω		24K791446		10 microhenries
L4	Mixer Grid	0Ω		24K790536		
L5	RF Choke	3.2Ω		24K792577		
L6	Osc. Coils	0Ω		24K790537		Alternate part #24C700114 (For M3B)
L7	RF Choke	2Ω		24K780128		
L8	Fil. Choke	.2Ω		24K790145		.47 microhenries
L9	1st Video IF	.5Ω	.5Ω	24K792578		Less slug
L10	RF Choke	3.2Ω		24K790035		
L11	2nd Video IF	.5Ω	0Ω	24B792586		With sound trap
L12	RF Choke	3.2Ω		24K790035		
L13	3rd Video IF	.5Ω	0Ω	24K792587		With sound trap
L14	Fil. Choke	.2Ω		24K790145		.47 microhenries
L15	Fil. Choke	.2Ω		24K790145		.47 microhenries
L16	4th Video IF	.5Ω	.5Ω	24B792585		Less slug
L17	RF Choke	.2Ω		24K790145		.47 microhenries
L18	Peaking	10Ω		24K792771		Yellow identification dot
L19	Peaking	4.5Ω		24K792772		Red identification dot
L20	Peaking	10Ω		24A790579		Wound on 18KΩ resistor
L21	4.5MC Sound Trap	2.5Ω		24B792735		
L22	Peaking			24A792588		Wound on 2.7KΩ resistor
L23	Sound IF	1.2Ω		24A470159		
L24	Ratio Det. Trans.	3Ω	.5Ω	24B790125		Less shield
L25	Horiz. Freq.	150Ω		25B790055		
L26A	Horiz. Size	3Ω		24B700088		
B	Horiz. Size			24B791170		Used when connected in series with yoke

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M1	.300ADC	48B791694	NH-5	
M2	.300ADC	48B791694	NH-5	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3A	RF Tuner	1X792770	
B	RF Tuner	1X700132	Distinguished from M3A by extra coil across cut-out on Osc. section of switch
M4	Ion Trap		
	Safety Glass	6IC792189	
	Knob	36B790506	Channel selector
	Knob	36B790505	Contrast
	Knob	36K792078	Fine tuning, TV volume
	Knob	36K792562	AM-FM controls, Model 16F1
	Knob	36K792561	AM-FM controls, Model 16F1B (Tan)
	Knob	36K792079	Fine tuning, TV volume, Models 16F1B (Tan), 16T1B
	Knob	36K792078	Fine tuning, TV volume, Model 16T1

RADIO **PARTS LIST AND DESCRIPTIONS**

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V21	FM-AM RF Amp.	12BA6	12BA6	7BK	
V22	FM-AM Conv.	12BA7	12BA7	8CT	
V23	1st FM IF Amp. - AM IF Amp.	12BA6	12BA6	7BK	
V24	2nd FM IF Amp.	12BA6	12BA6	7BK	
V25	Ratio Det. -Det. - AF Amp.	19T8	19T8	9E	
V26	Power Output	50C5	50C5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C106A	50	150	23B690539	AFH888D		UPE555		TVL-305	■ Filter
B	50	150				15			▲ Filter
C	50	150							Filter
C107	3	50	23K690543	PRS150/4		BR550		TVA-60	Stabilizing Cap.
C108	1000		21K478410	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Line Ant. Coupling
C109	.01	400	8S9809	P488-01	D6-103	PTE4S1	811-01	TM-11	Ant. Isolation
C110	.05	400	8A470606	P488-05		PTE4S5		TM-15	AVC Filter
C111	47		21K77373	GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	RF Cath. Byp.
C112	.05	200	8S9821	P288-05		PTE4S5		TM-15	RF Decoup.
C113	500		21K481377	GP500M	D6-501	5W5T5	GP2K-500	1FM-35	RF Decoup.
C114	1000		21K478410	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	FM RF Grid Filter
C115	100		21B77286	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
C116	24		21K28816	GP25K	DN-24	5W5Q25	GP1K-24	MS-425	RF Coupling
C117	.01	100	8S9801	P488-01	D6-103	PTE4S1	811-01	TM-11	AVC Filter
C118	24		21K28816	GP25K	DN-24	5W5Q25	GP1K-24	MS-425	Osc. Grid Cap.
C119	85		21A690688	CN85JN150			N150K-85		Fixed Trimmer
C120	47		21K77373	GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	Osc. Feedback
C121	.01	400	8S9809	P488-01	D6-103	PTE4S1	811-01	TM-11	Conv. Decoup.
C122	100		21B77286	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Conv. Decoup.
C123	1000		21K471761	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	RF Fil. Bypass
C124	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	1st IF Cath. Byp.
C125	.002	400	8S9824	P688-002	D6-202	PTE6D2	GP2M-002	TM-24	1st IF Decoup.
C126	100			GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C127	100			GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C128	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C129	2000		21K790912	GP200M	D6-202	1W5D2	GP2M-002	1FM-22	2nd IF Cath. Byp.
C130	.002	400	8S9824	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	2nd IF Decoupling
C131	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	2nd IF Fil. Byp.
C132	5000		21A470789	BPD-5	D6-502	1D5D5	811-005	29C1	2nd IF Fil. Byp.
C133	250	500	21K77375	1468-00025	D6-251	5W5T25	GP2K-250	1FM-325	Diode Load Cap.
C134	250	500	21K77375	1468-00025	D6-251	5W5T25	GP2K-250	1FM-325	Diode Load Cap.
C135	1000		21K478410	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	De-emphasis
C136	.05	400	8A470606	P488-05		PTE4S5		TM-15	Phono Isolation
C137	.005	100	8A24966	P688-005	D6-502	PTE6D5	811-005	TM-25	Audio Coupling
C138	100		21B77286	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	AF Amp. Plate Byp.
C139	.005	100	8A24966	P688-005	D6-502	PTE6D5	811-005	TM-25	Audio Coupling
C140	.03	600	8R9872	P688-03		PTE6S3		TM-13	Output Plate Byp.
C141	.1	200	8K471636	P288-1		PTE4P1		TM-1	Tone Comp.
C142	1000		21K478410	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Filament Byp.
C143	.05	400	8A470606	P488-05		PTE4S5		TM-15	Record Ch. Isolation
C144	.05	400	8A470606	P488-05		PTE4S5		TM-15	Line Filter

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R99A	1 Meg.	½	18A690549	QI3-137	AM-63-Z	BSK-70-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R99A per instructions
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R99A per instructions
R100A	100KΩ	½	18B69111882				Tone control
B	Switch		Not Req.				Phono-Radio switch

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
R101	100KΩ	½	6R6075	BTS-100K	AVC Network
R102	22KΩ	½	6R6026	BTS-22K	FM RF Grid
R103	68Ω	½	6R2039		RF Cathode
R104	4700Ω	½	6R6039	BTS-4700	AM RF Plate
R105	220Ω	½	6R3933	BW-½-220	RF Decoupling
R106	33KΩ	½	6R6012	BTS-33K	Conv. Grid
R107	22KΩ	½	6R6028	BTS-22K	Conv. Grid
R108	47KΩ	½	6R6056	BTS-47K	Osc. Grid
R109	220Ω	½	6R3933	BW-½-220	Conv. Decoupling
R110	2.2 Meg.	½	6R3927	BTS-2.2 Meg.	AVC Network
R111	68Ω	½	6R2039		1st IF Cathode
R112	220Ω	½	6R3933	BW-½-220	1st IF Decoupling
R113	47KΩ	½		BTS-47K	Diode Filter
R114	1.5 Meg.	½	6R3966	BTS-1.5 Meg.	Diode Load
R115	68Ω	½	6R2039		2nd FM IF Cathode

RADIO **PARTS LIST AND DESCRIPTIONS (Continued)**

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
R116	220Ω	½	6R3933	BW-½-220	2nd FM IF Decoupling
R117	22KΩ	½	6R6028	BTS-22K	De-emphasis
R118	33KΩ	½	6R6012	BTS-33K	Ratio Det. Diode Load
R119	22KΩ	½	6R6028	BTS-22K	AVC Network
R120	4.7 Meg.	½	6R2122	BTS-4.7 Meg.	AF Amp. Grid
R121	470KΩ	½	6R6032	BTS-470K	AF Amp. Plate
R122	390Ω	½	6R5554	BW-½-390	Tone Compensation
R123	3300Ω	½	6R6036	BTS-3300	Tone Compensation
R124	3300Ω	½	6R6036	BTS-3300	Tone Compensation
R125	220Ω	½	6R3933	BW-½-220	Tone Compensation
R126	180Ω	½	6R5660	BW-½-180	Feedback
R127	470KΩ	½	6R6032	BTS-470K	Output Grid
R128	560Ω	½	6R6291	BTS-560	Output Cathode
R129	27Ω	½	6R5683		Voice Coil Shunt
R130	270Ω	2	6R476116	BW-2-270	Filter
R131	100Ω	2	6R3963	BW-2-100	Filter
R132	22Ω	½	17A690578		Surge Limiter

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP3	PM	4Ω	50C791427	ST-119 ③ MOD. P10-T	10A4A	③ Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP4	9 1/4"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L27	FM Ant.	.1Ω	.1Ω	24A690544		
L28	RF Choke	.2Ω		24A90064		
L29	FM RF	0Ω		24C690584		
L30	FM Osc.	0Ω		24K600519		Less slug
L31	RF Choke	0Ω		24A691847		
L32	RF Choke	2Ω		24K780128		
L33	Fil. Choke	2Ω		24K780128		
L34	Fil. Choke	2Ω		24K780128		
L35	Loop Ant.	1.2Ω		1X792541		Loop and panel assembly, less line cord
L36	AM Osc.	.3Ω	8.7Ω	24K691878	14-1073	
L37	1st AM IF	15Ω	15Ω	24B482863	16-6758	
L38	1st FM IF	2Ω	.8Ω	24B690540	16-3487	
L39	2nd AM IF	15Ω	15Ω	24B482865	16-6758	
L40	2nd FM IF	5Ω	.8Ω	24B690541	16-3487	
L41	Ratio Det. Trans.	2.1Ω	.2Ω	24B690542		
L42	RF Choke	1Ω		24K691041		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.		
M5	.102ADC	48B482807	ND-5		

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	MOTOROLA PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M6		AC-AG-J	A-AG	W26B	A66U	

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M7	Bayonet	115-120					Type 117 Volt, 10 Watt

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M8	Switch	40B690538	FM-AM
M9	Tuning Cap.	19B691877	AM

OPERADIO MODELS
4A30-A, 4A50-A, 4A51-A

OPERADIO MODELS
4A30-A, 4A50-A, 4A51-A

OPERADIO MODEL 4A30-A

TRADE NAME	Operadio (Flexifone) Models 4A30-A,, 4A50-A, 4A51-A	
MANUFACTURER	Operadio Mfg. Co., St. Charles, Illinois	
TYPE SET	AC-DC Operated Intercommunication System	
TUBES (TWO)	Types 12AU6 AF Amp., 50B5 Power Output	
POWER SUPPLY	110-120 Volts AC-DC	RATING .22 Amp. at 117 Volts AC

DESCRIPTION

The Model 4A30-A is a master station designed to operate with three remote statios. The Model 4A50-A is a remote station with a call switch which enables it to originate calls to the master unit. The Model 4A51-A is a remote station which has no call switch and can only carry on a two way conversation after a master station has selected it.

CONNECTIONS

The model 4A51-A and the receive "R" on the model 4A50-A are connected to the master station by using a twisted pair of leads. One lead connects to the "C" or comman on the Master Station and the other lead connects to terminals 1, 2 or 3 depending on what position it is on the selector switch. The send "S" terminals on the model 4A50-A are connected to the Master Station by using a shielded lead. The shield connects to the "C" terminal and the lead connects to the "R" terminal on the Master Station.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

OPERADIO MODEL 4A30A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		OPERADIO PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	262-12AU6	12AU6	7BK	
V2	Power Output	262-50B5	50B5	7BZ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	OPERADIO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	199-2925	PRSA86D4A		EDL4215C		TA-305	Filter-Red
B	20	150							Filter-Blue
C	20	25							Output Cath. Byp. -Green
C2	.003	600	199-4030-302	P688-003	D6-302	PTE6D3	GP2M-003	TM-23	Audio Coupling
C3	.01	400	199-4020-103	P488-01	D6-103	PTE4S1	821-01	TM-11	AF Amp. Screen Byp.
C4	.001	600	199-4030-102	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	Audio Coupling
C5	.006	600	199-4030-602	P688-006	D6-562	PTE6D6	GP2M-0056	TM-26	Output Plate Byp.
C6	.05	400	199-4021-503	P488-05	DF-503	PTE4S5		TM-15	Line Isolation

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	OPERADIO PART No.	IRC PART No.	
R1	68KΩ	1	600-0116-683	BTA-68K	Input Transformer Shunt
R2	270KΩ	1	600-0116-274	BTA-270K	AF Amp. Plate
R3	1.5 Meg.	1	600-0116-155	BTA-1.5 Meg.	AF Amp. Screen
R4	470KΩ	1	600-0116-474	BTA-470K	Output Grid
R5	270Ω	1	600-0116-271	BW-1-270	Output Cathode
R6	18KΩ	1	600-0116-183	BTA-18K	Filter
R7	100Ω	1	600-0116-101		Surge Limiter
R8	350Ω	10	600-1011-351	AB-350	Filament Dropping-Wire Wound

TRANSFORMER (INPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	TURNS RATIO		DC RES.		OPERADIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	1	53	.4Ω	760Ω	710-9				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		OPERADIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	2.1KΩ	15Ω	190Ω	1Ω	710-2029			RO-2	

CHASSIS—TOP VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			OPERADIO PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.			4A07Z15	
SP1A	PM	15Ω	S-10740P3WCK4		4A07Z17	
B	PM	17Ω				
	CONE DIA.	V. C. DIA.				
SP2A	4"	9/16"				
B	4"	9/16"				

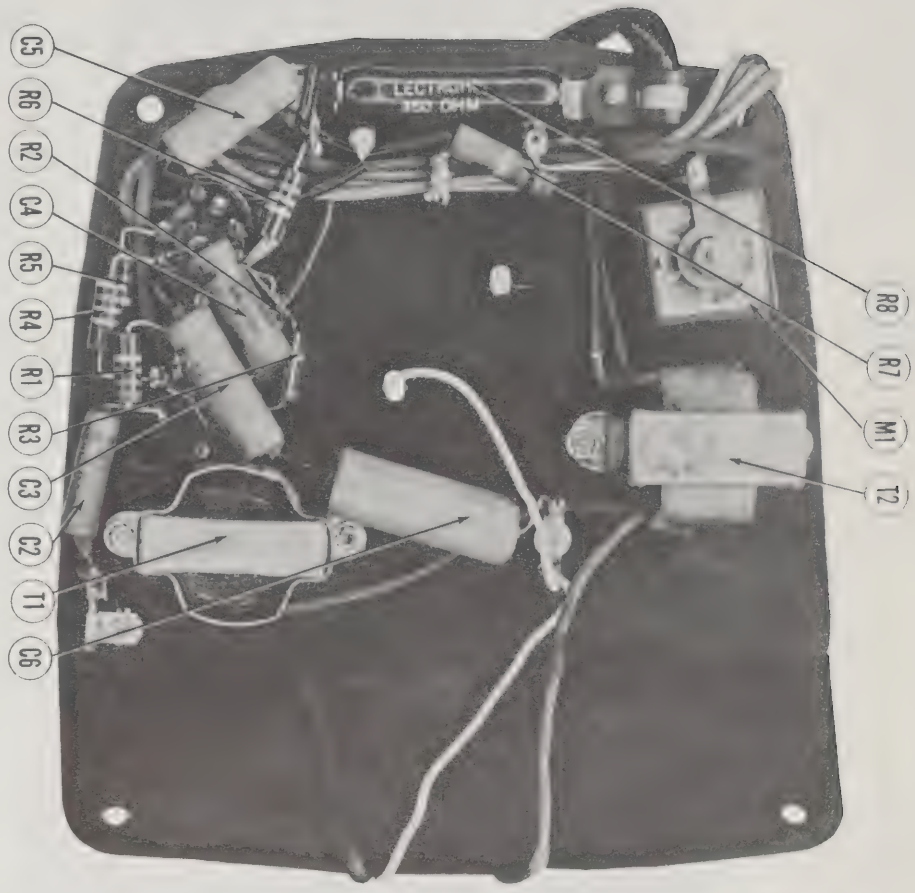
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	OPERADIO PART No.	SYLVANIA PART No.		
M1	.030A	595-2	NB-5		

MISCELLANEOUS

ITEM No.	PART NAME	OPERADIO PART No.	NOTES
M2	Switch	680-58	Talk-Listen-Station
M3	Switch		Remote Call

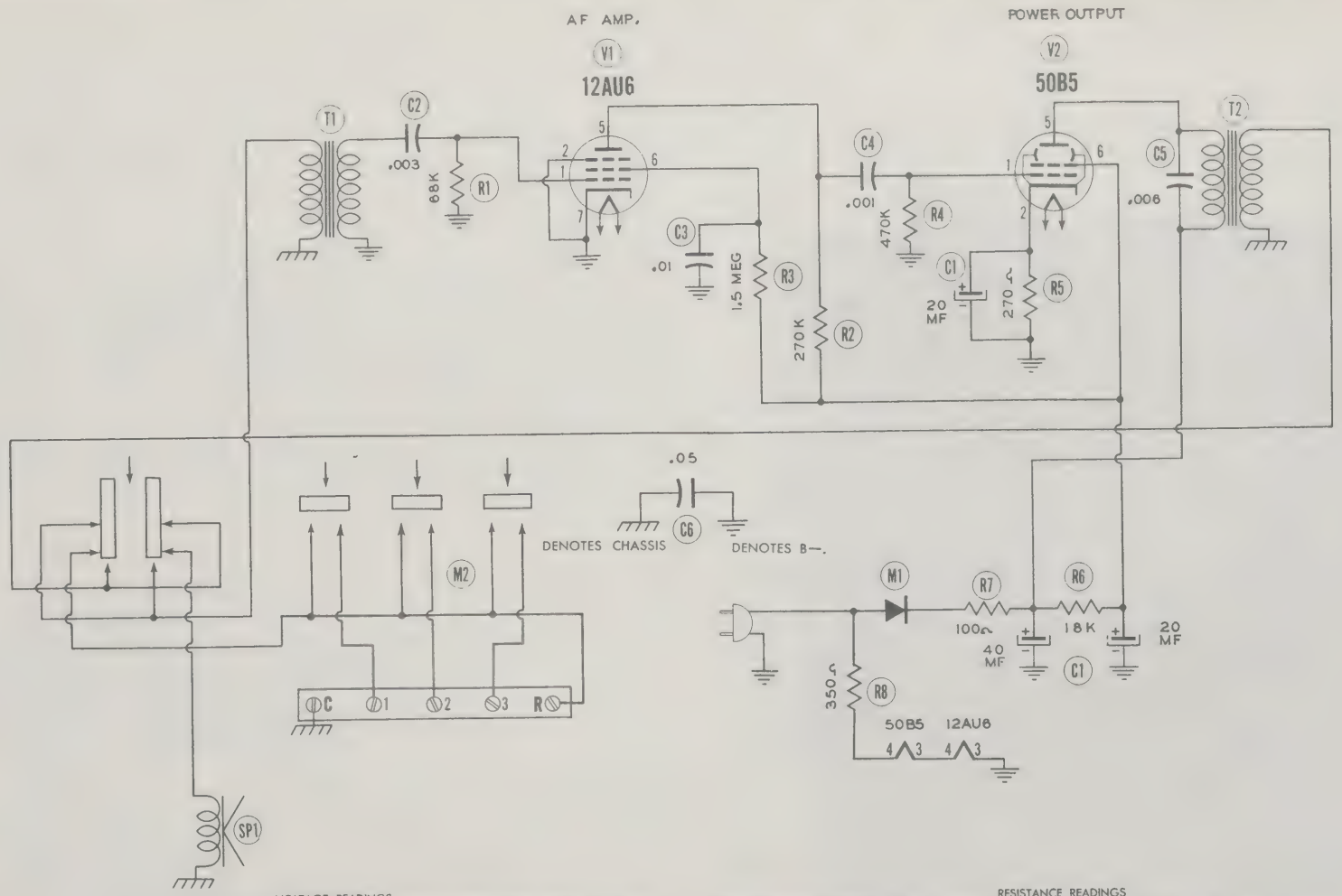
CHASSIS—BOTTOM VIEW



SET 102 FOLDER 9

OPERADIO MODEL 4A30A

OPERADIO MODEL 4A30A



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	-.6VDC	0V.	0V.	12.5VAC	37VDC	6.3VDC	0V.
V 2	50B5	0V.	7.7VDC	12.5VAC	62VAC	135VDC	130VDC	0V.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	68KΩ	0Ω	0Ω	12.5Ω	†290KΩ	†1.5 Meg.	0Ω
V 2	50B5	470KΩ	270Ω	12.5Ω	62Ω	†290Ω	†18KΩ	470KΩ

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHILCO
MODEL 51-934

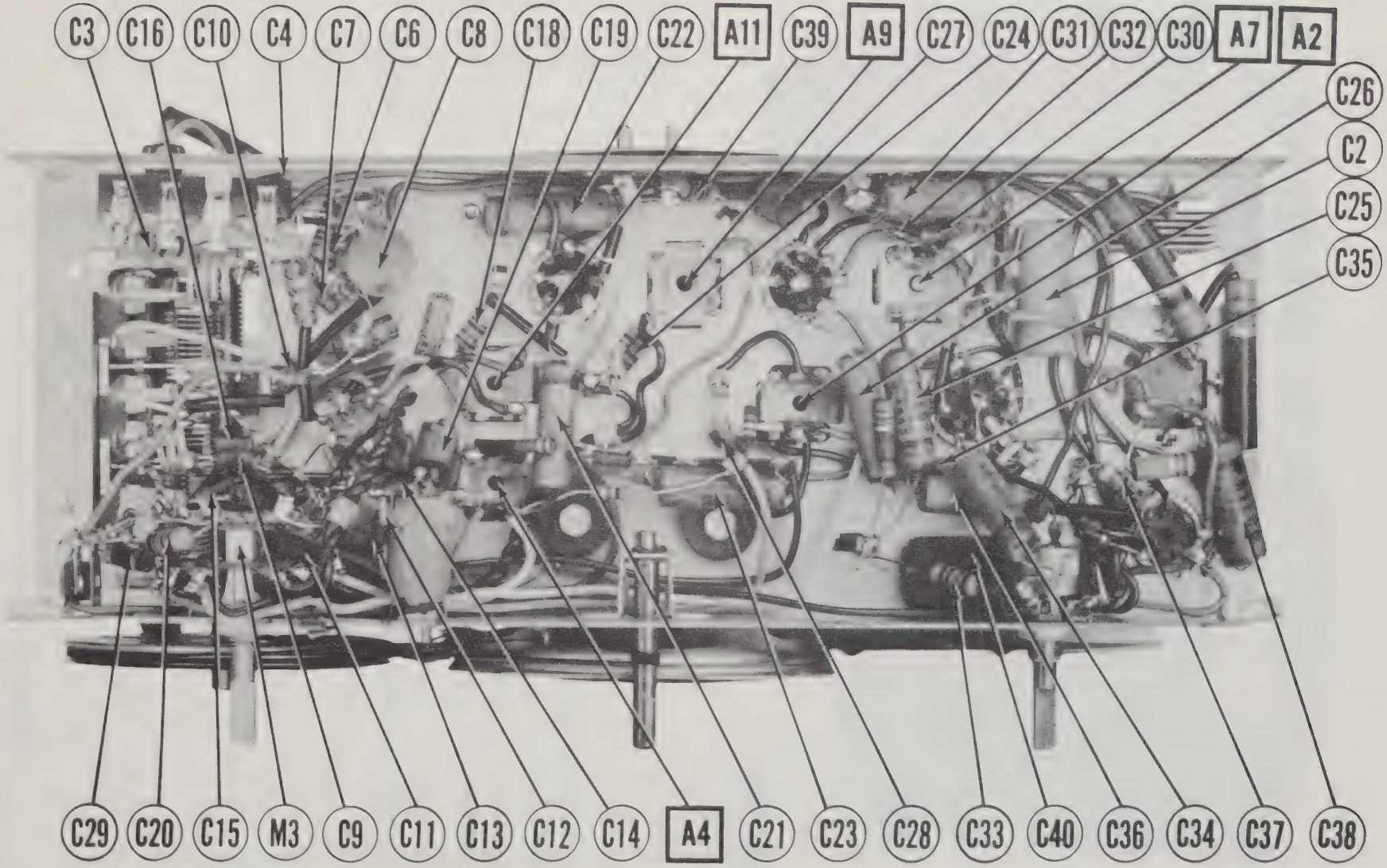
PHILCO
MODEL 51-934

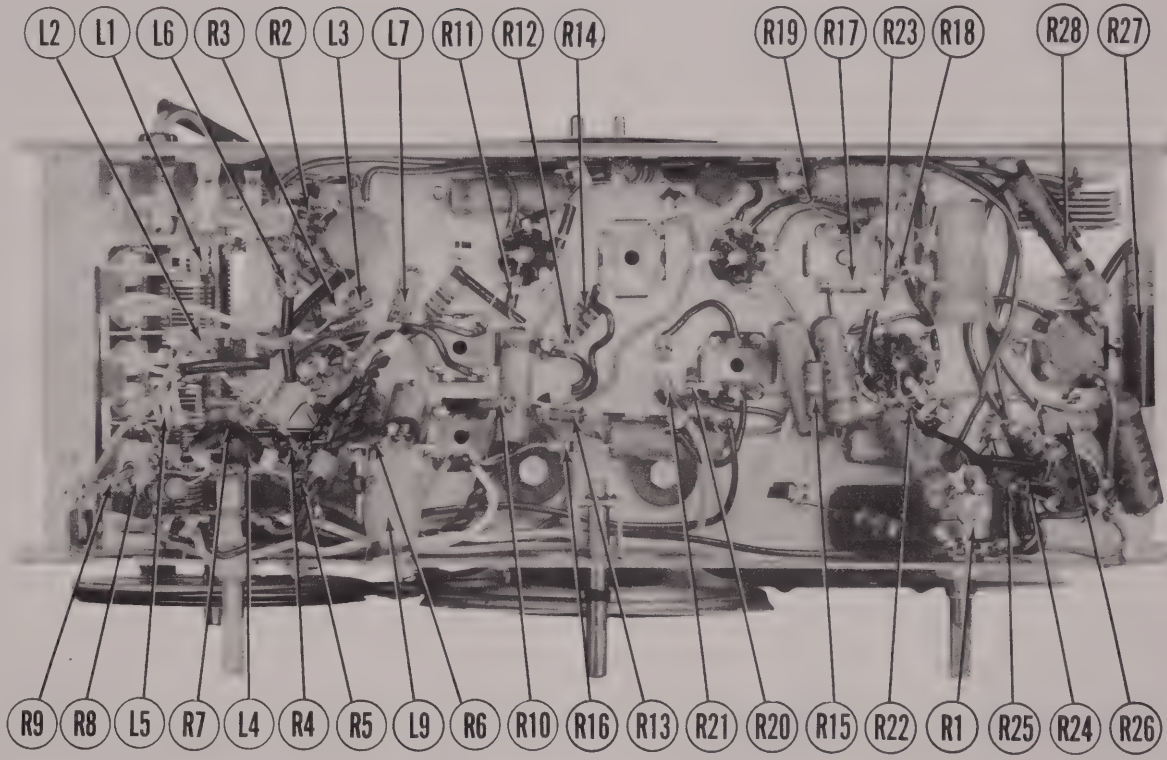
PHILCO MODEL 51-934

TRADE NAME	Philco, Model 51-934	
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.	
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna	
TUBES (SIX)	Types 12AU6 FM RF Amp., 12AT7 Converter, 12BA6 1st IF Amp., 12AU6 2nd IF Amp., 19C8 DET-AVC-AF, 50C5 Power Output	
POWER SUPPLY	105-125 Volts AC-DC	RATING .35 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1630KC	FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


C3
C16
C10
C4
C7
C6
C8
C18
C19
C22
A11
C39
A9
C27
C24
C31
C32
C30
A7
A2
C26
C2
C25
C35
C29
C20
C15
M3
C9
C11
C13
C12
C14
A4
C21
C23
C28
C33
C40
C36
C34
C37
C38


L2
L1
L6
R3
R2
L3
L7
R11
R12
R14
R19
R17
R23
R18
R28
R27
R9
R8
L5
R7
L4
R4
R5
L9
R6
R10
R16
R13
R21
R20
R15
R22
R1
R25
R24
R26

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to last reference mark on low frequency end of dial backplate. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and chassis.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 12AT7 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	AM (fully counter clock - wise)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1630KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1500KC	"	Adjust for max. output.	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistor in series from point A to chassis. The junction of these two resistors is alignment point C as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.1MFD	High side to pin 1 (Grid) of 12BA6 (V3). Low side to chassis.	9.1MC (Unmod.)	FM (CW)	Tuning gang fully open	DC Probe to Point (A). Common to chassis.	A7, A8, A9	Adjust for maximum deflection. Attenuate signal generator to maintain a -10 volt reading.
5.	.1MFD	High side to pin 7 (Grid) of 12AT7 (V2). Low side to chassis.	"	"	"	"	A10, A11	"
6.	.1MFD	"	"	"	"	DC Probe to Point (B). Common to Point (C).	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.1MFD	High side to pin 1 (Grid) of 12BA6 (V3). Low side to chassis.	9.1MC (450KC Sweep)	FM (CW)	Tuning gang fully open	Vert. Amp. to Point (A). Low side to chassis.	A7, A8,	Disconnect stabilizer capacitor C2. Adjust for maximum amplitude and symmetry as per fig 1.
5.	.1MFD	High side to pin 7 (Grid) of 12AT7 (V2). Low side to chassis.	"	"	"	"	A10, A11	"
6.	.1MFD	"	"	"	"	Vert. Amp. to Point (B). Low side to chassis.	A12	Reconnect capacitor C2. Adjust A12 to place 9.1MC at center of crossover lines as per fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Direct	Across antenna terminals.	105MC (Unmod.)	FM (CW)	Set pointer to third reference mark from right hand end of dial backplate.	DC Probe to Point (A). Common to chassis.	A13, A14, A15	Adjust for maximum deflection.
8.	Direct	"	92MC	"	Set pointer to third reference mark from left hand edge of dial backplate.	"	L5, L2, L1	Expand or compress coil turns in order given for maximum deflection. Repeat steps 7 and 8 until no further improvement can be made.

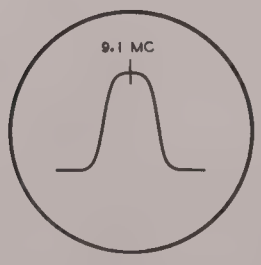


FIG. 1

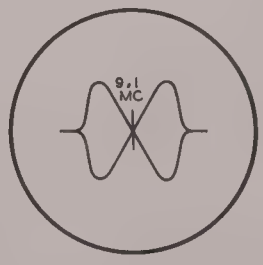
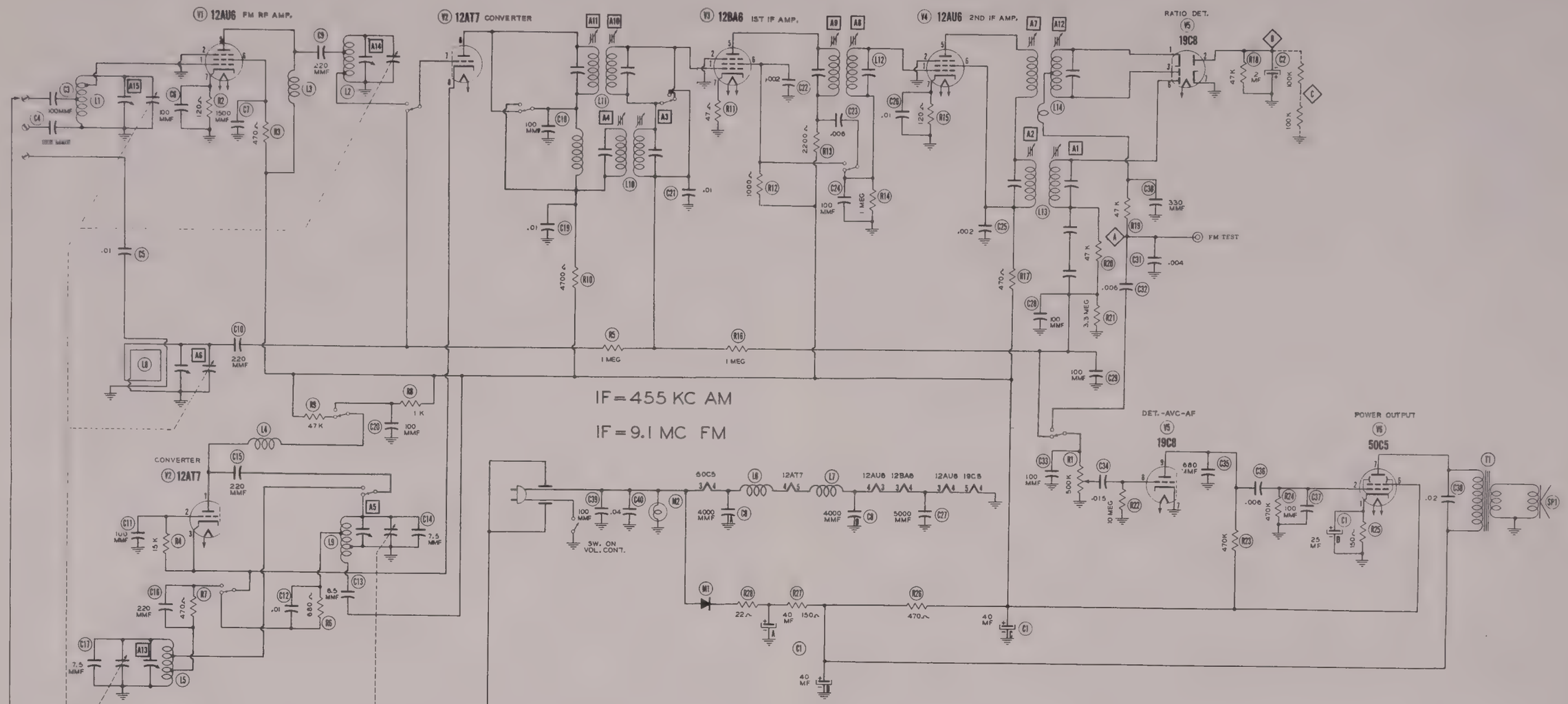


FIG. 2



VOLTAGE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AU6	0V.	0V.	41VAC	50VAC	105VDC	100VDC	.9VDC		
†	V2	12AT7	100VDC	§1.4VDC	2.8VDC	63VAC	50VAC	95VDC	0V.		
#	V2	12AT7	42VDC	§-.3VDC	1.6VDC	63VAC	50VAC	105VDC	-1.1VDC		
†	V3	12BA6	-.2VDC	0V.	41VAC	29VAC	85VDC	100VDC	.5VDC		
#	V3	12BA6	-.3VDC	0V.	41VAC	29VAC	95VDC	105VDC	.5VDC		
†	V4	12AU6	-.1VDC	0V.	29VAC	17VAC	100VDC	100VDC	.8VDC		
#	V4	12AU6	-.1VDC	0V.	29VAC	17VAC	105VDC	105VDC	.8VDC		
†	V5	19C8	-1VDC	-.9VDC	-1VDC	0V.	17VAC	-.8VDC	0V.	-1VDC	70VDC
#	V5	19C8	-.4VDC	-.9VDC	-.4VDC	0V.	17VAC	-.6VDC	0V.	-1VDC	70VDC
#	V6	50C5	7VDC	.1VDC	117VAC	63VAC	.1VDC	105VDC	115VDC		

RESISTANCE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AU6	0Ω	0Ω	43Ω	53Ω	†640Ω	†1.1KΩ	120Ω		
†	V2	12AT6	†1.6KΩ	15KΩ	470Ω	60Ω	53Ω	†5.5KΩ	0Ω	470Ω	50Ω
#	V2	12AT6	†47KΩ	15KΩ	680Ω	60Ω	53Ω	†5.5KΩ	2.5 Meg.	680Ω	50Ω
†	V3	12BA6	†4.3 Meg.	0Ω	43Ω	32Ω	†2.8KΩ	†1.6KΩ	47Ω		
#	V3	12BA6	1.5 Meg.	0Ω	43Ω	32Ω	†2.8KΩ	†1.6KΩ	47Ω		
†	V4	12AU6	1 Meg.	0Ω	32Ω	22Ω	†1.1KΩ	†1.1KΩ	120Ω		
#	V4	12AU6	1 Meg.	0Ω	32Ω	22Ω	†1.1KΩ	†1.1KΩ	120Ω		
†	V5	19C8	Inf.	47KΩ	Inf.	0Ω	22Ω	3.3 Meg.	0Ω	10 Meg.	†470KΩ
#	V5	19C8	Inf.	47KΩ	Inf.	0Ω	22Ω	550KΩ	0Ω	10 Meg.	†470KΩ
#	V6	50C5	150Ω	470KΩ	95Ω	80Ω	470KΩ	†640Ω	†390Ω		

§ TAKEN IN "AM" POSITION
† TAKEN IN "FM" POSITION.

† MEASURED FROM OUTPUT OF M1.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1950

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp.	12AU6	12AU6	7BK	
V2	Converter	12AT7	12AT7	9A	
V3	1st IF Amp.	12BA6	12BA6	7BK	
V4	2nd IF Amp.	12AU6	12AU6	7BK	
V5	Ratio Det. -DET-AVC-AF	19C8	19C8	9E	
V6	Power Output	50C5	50C5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	30-2570-46						• Filter
B	70	150							■ Filter
C	40	150							▲ Filter
D	25	25							Output Cath. Byp.
C2	2	50	30-2417-7	E26E6		BBR2-50		TVA-12	Stabilizing Cap.
C3	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Ant. Coupling
C4	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Ant. Coupling
C5	.01	400	45-3505-41	P488-01	D6-103	PTE4S1	811-01	TM-11	Ant. Coupling
C6	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	FM RF Cath. Byp.
C7	1500		62-215001011	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	FM RF Screen Byp.
C8A	4000		30-1239	BPD-5	D6-472	1D5D4	882-2 x 004	36C2	Filament Byp.
B	4000			BPD-5	D6-472	1D5D4			Filament Byp.
C9	220		62-122001001	GP220M	D6-221	5W5T25	GP2K-220	1FM-325	RF Coupling
C10	220		62-122001001	GP220M	D6-221	5W5T25	GP2K-220	1FM-325	RF Coupling
C11	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Osc. Grid Byp.
C12	.01	100	30-1226-10	P488-01	D6-103	PTE4S1	811-01	TM-11	Conv. Cath. Byp.
C13	6.5		30-1224-6	SI6.5DNPO	D2-6.8		NPOK-6.8		Osc. Coupling
C14	7.5		30-1224-8	SI7.5FN220			N220K-7.5		Fixed Trimmer
C15	220		62-122001001	GP220M	D6-221	5W5T25	GP2K-220	1FM-325	Osc. Feedback
C16	220		62-122001001	GP220M	D6-221	5W5T25	GP2K-220	1FM-325	Conv. Cath. Byp.
C17	7.5		30-1224-8	SI7.5DNPO			NPOK-7.5		Fixed Trimmer
C18	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Fixed Trimmer
C19	.01	400	30-4572	P488-01	D6-103	PTE4S1	811-01	TM-11	Conv. Plate Dec.
C20	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Osc. Plate Dec.
C21	.01	400	30-4572	P488-01	D6-103	PTE4S1	811-01	TM-11	AVC Filter
C22	.002	400	61-0062	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	1st IF Screen Byp.
C23	.006	400	45-3500-7	P488-006	D6-562	PTE6D6	811-005	TM-26	IF Coupling
C24	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	2nd IF Grid Filter
C25	.002	400	61-0062	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	2nd IF Decoupling
C26	.01	400	30-4572	P488-01	D6-103	PTE4S1	811-01	TM-11	2nd IF Cath. Bypass
C27	5000		30-1238-1	BPD-5	D6-502	1D5D5	811-005	29C1	2nd IF Fil. Bypass
C28	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C29	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C30	330		62-133001001	GP330M	D6-331	5W5T3	GP2K-330	1FM-335	Diode Load Cap.
C31	.004	400	61-0179	P688-004		PTE6D4	GP2M-004	TM-24	De-emphasis
C32	.006	400	45-3500-7	P488-006	D6-562	PTE6D6	811-005	TM-26	Audio Coupling
C33	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Bypass
C34	.015	400	61-0108	P488-015		PTE4S2		TM-12	Audio Coupling
C35	680		62-168001001	GP680M	D6-681	1W5T7	GP2K-680	1FM-37	AF Amp. Plate Byp.
C36	.006	400	61-0105	P488-006	D6-562	PTE6D6	811-005	TM-26	Audio Coupling
C37	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Output Grid Bypass
C38	.02	400	61-0105	P488-02		PTE4S2		TM-12	Output Plate Byp. *
C39	100		62-110009001	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Bypass
C40	.04	400	45-3500	P488-04		PTE6S4		TM-14	Line Filter

* Some models use .006MFD in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	33-5566-20	Q13-133	AM-60-Z	B-60-S	Volume control and switch
B	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A per instructions
C	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions

SET 102

FOLDER 10

CHASSIS—TOP VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PART No.	IRC PART No.	
R2	120Ω	½	66-1128340		RF Amp. Cathode-Wire Wound
R3	470Ω	½	66-1478340	BTS-470	RF Amp. Screen
R4	15KΩ	½	66-3158340	BTS-15K	Conv. Grid
R5	1 Meg.	½	66-5108340	BTS-1 Meg.	Conv. Grid
R6	680Ω	½	66-1688340		Parasitic Suppressor
R7	470Ω	½	66-1478340		Parasitic Suppressor
R8	1000Ω	½	66-2108340	BTS-1000	FM Conv. Plate
R9	47KΩ	½	66-3478340	BTS-47K	AM Conv. Plate
R10	4700Ω	½	66-2478340	BTS-4700	Conv. Plate Decoupling
R11	47Ω	½	66-0478340	BW-½-47	1st IF Amp. Cathode
R12	1000Ω	½	66-2108340	BTS-1000	1st IF Amp. Screen Decoupling
R13	2200Ω	½	66-2228340	BTS-2200	1st IF Amp. Plate Decoupling
R14	1 Meg.	½	66-1058340	BTS-1 Meg.	2nd IF Amp. Grid
R15	120Ω	½	66-1128340		2nd IF Amp. Cathode-Wire Wound
R16	1 Meg.	½	66-5108340	BTS-1 Meg.	AVC Network
R17	470Ω	½	66-1478340	BTS-470	2nd IF Amp. Decoupling
R18	47KΩ	½	66-3478340	BTS-47K	Ratio Det. Diode Load
R19	47KΩ	½	66-3478430	BTS-47K	De-emphasis
R20	47KΩ	½	66-3478340	BTS-47K	Filter
R21	3.3 Meg.	½	66-5338340	BTS-3.3 Meg.	AVC Diode Load
R22	10 Meg.	½	66-6108340	BTS-10 Meg.	AF Amp. Grid
R23	470KΩ	½	66-4478340	BTS-470K	AF Amp. Plate
R24	470KΩ	½	66-4478340	BTS-470K	Output Grid
R25	150Ω	½	66-1158340	BW-½-150	Output Cathode
R26	470Ω	1	66-1474340	BTA-470	Filter
R27	150Ω	2	66-1185340	BW-2-150	Filter-Wire Wound
R28	22Ω	2	66-0225340		Surge Limiting-Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILCO	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T1	2400Ω	3.5Ω	220Ω	.6Ω	Part of SP1	A-3332 ①	A-3025 ①	RO-2	① Bend mounting tabs down.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PHILCO PART No.	JENSEN PART No.	OUAM PART No.	
	FIELD	V. C. IMP.		ST-113 ②		
SP1	PM	3.5Ω	32-1614-6	MOD. P4-X	4A07 ②	② Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
L1	FM Ant.	0Ω		32-4415-1		
L2	FM RF	0Ω		32-4416-1		
L3	RF Choke	3.1Ω		32-4422-10		3.3 microhenries
L4	RF Choke	3.1Ω		32-4422-10		3.3 microhenries
L5	FM Osc.	0Ω		32-4414-1		
L6	Fil. Choke	1.9Ω		32-4422-8		2.2 microhenries
L7	Fil. Choke	1.9Ω		32-4422-8		2.2 microhenries
L8	Loop Ant.	.8Ω	4Ω	32-4052-49		
L9	AM Osc.	10.5Ω		32-4458		Taps at 4Ω and 3.1Ω
L10	1st AM IF	5Ω	12.5Ω	32-4258-3A		
L11	1st FM IF	.2Ω	.2Ω	32-4372A	16-3487	
L12	2nd FM IF	2.2Ω	2.2Ω	32-4372-2A	16-3487	
L13	2nd AM IF	16.5Ω	16.5Ω	32-4240A	16-6770	
L14	Ratio Det. Trans.	3.5Ω	.5Ω	32-4310-1A		

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

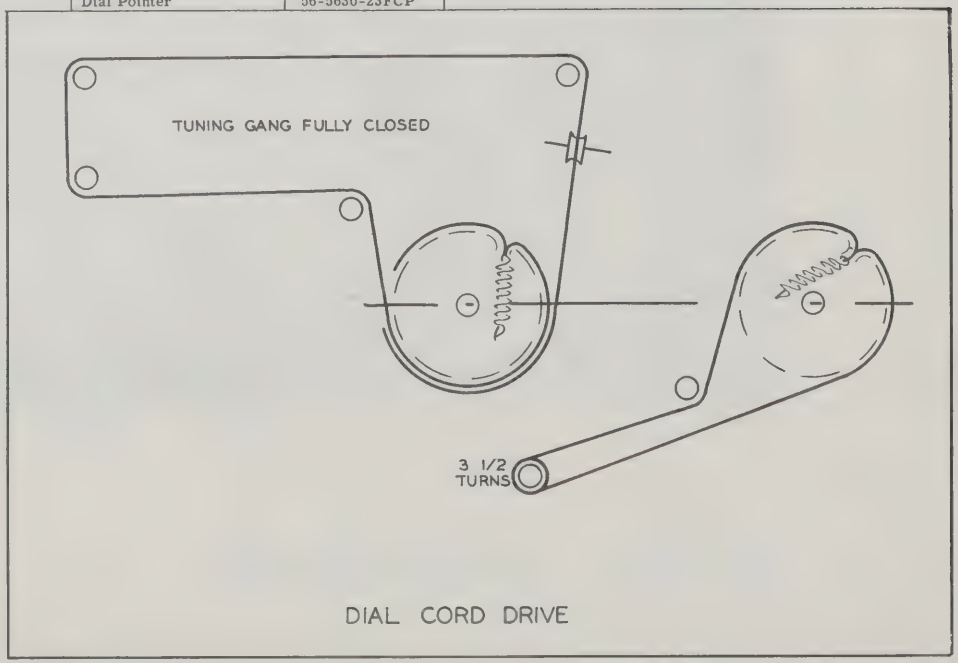
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	PHILCO PART No.	SYLVANIA PART No.		
M1	.075ADC	34-8003-1	NC-5		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PHILCO PART No.		
M2	Screw	120			34-2605		Type 120 Volt, 7 Watt

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Switch	42-1924	Band
M4	2 Gang Var. Cap.	31-2756	(26-292MMF, 15-197MMF)
A13	Trimmer	31-6511	FM Osc. Adj.
	Cabinet	10796	
	Dial Scale	54-5089	
	Knob	54-4774-2	FM-AM
	Knob	54-4774	Tuning
	Knob	54-4774-1	Volume/Off-On
	Dial Pointer	56-5630-23FCP	



DIAL CORD DRIVE

RCA VICTOR MODELS BX55 (Ch. RC-1088), BX57 (Ch. RC-1088A)

RCA VICTOR MODELS BX55 (Ch. RC-1088), BX57 (Ch. RC-1088A)

RCA VICTOR MODELS BX55 (Ch. RC-1088), BX57 (Ch. RC-1088A)

RCA VICTOR MODEL BX55

TRADE NAME	RCA Victor Models BX55 (Ch. RC-1088), BX57 (Ch. RC-1088A)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, New Jersey
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 1R5 Converter, 1T4 or or 1U4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC or 7.5 Volts "A" Supply and 75 Volts "B" Supply in Pack Form
RATING	.15 Amp. at 117 Volts AC or 60MA at 7.5 Volts DC and 10MA at 75 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to reference mark at low frequency end of chassis.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

Remove chassis and connect 10KΩ resistor across antenna section of tuning gang.

Those sets which do not have oscillator coil slug, ignore step 4.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (Grid) of 1R5 (V1). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation. Remove 10KΩ resistor and install in cabinet. Reconnect loop antenna.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	
4.		Loop	600KC	Set right hand edge of pointer carriage 13/32" from reference mark on low frequency end of chassis.	"	A7	Rock tuning gang while adjusting A7 for maximum output. Repeat steps 3 and 4 until no further improvement can be made.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

RCA VICTOR MODEL BX55

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2A	IF Amp.	1T4	1T4	6AR	Model BX57
B	IF Amp.	1U4	1U4	6AR	Model BX55
V3	DET-AVC-AF	1U5	1U5	6BW	
V4	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	150	74774	AF666D8A		UP333315		EL-434	▲ Filter
B	30	150				C4			■ Filter
C	20	150							▲ Filter
D	30	25							Filament Bypass
C2	.05	400	73553	P488-05		PTE4S5		TM-15	AVC Filter
C3	56	500	39622	1468-00005	D6-560	5W5Q5	GP1K-56	1FM-45	Osc. Grid Cap.
C4	.05	200	73553	P288-05		PTE4S5		TM-15	Osc. Anode Bypass
C5	.1	400	70617	P488-1		PTE4P1		TM-1	Filament Bypass *
C6	.01	200	73561	P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C7	.05	200	73553	P288-05		PTE4S5		TM-15	AF Amp. Screen Byp.
C8	.002	200	72315	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Audio Coupling
C9	100	500	39628	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Output Grid Byp.
C10	.005	400	73920	P688-005	D6-502	PTE6D5	811-005	TM-25	Output Plate Byp.
C11	.1	400	70617	P488-1		PTE4P1		72P52	Line Isolation
C12	.047	400	75071	P488-047		PTE4S5		TM-15	Line Filter
C13	.05	200	73553	P288-05		PTE4S5		TM-15	Filament Bypass †
C14	.003	200	73961	P688-003	D6-302	PTE6D3	GP2M-003	TM-23	IF Grid Filter †
C15	4		73153	CN4DNPO					Neutralizing †

* Model BX57 uses .05MFD in this application.
† Used only in model BX57.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	73125	Q13-137		B-70-S	Volume control and switch
B	Switch		Not Req.	76-2		Not Req.	Attach to R1A per instructions

RESISTORS

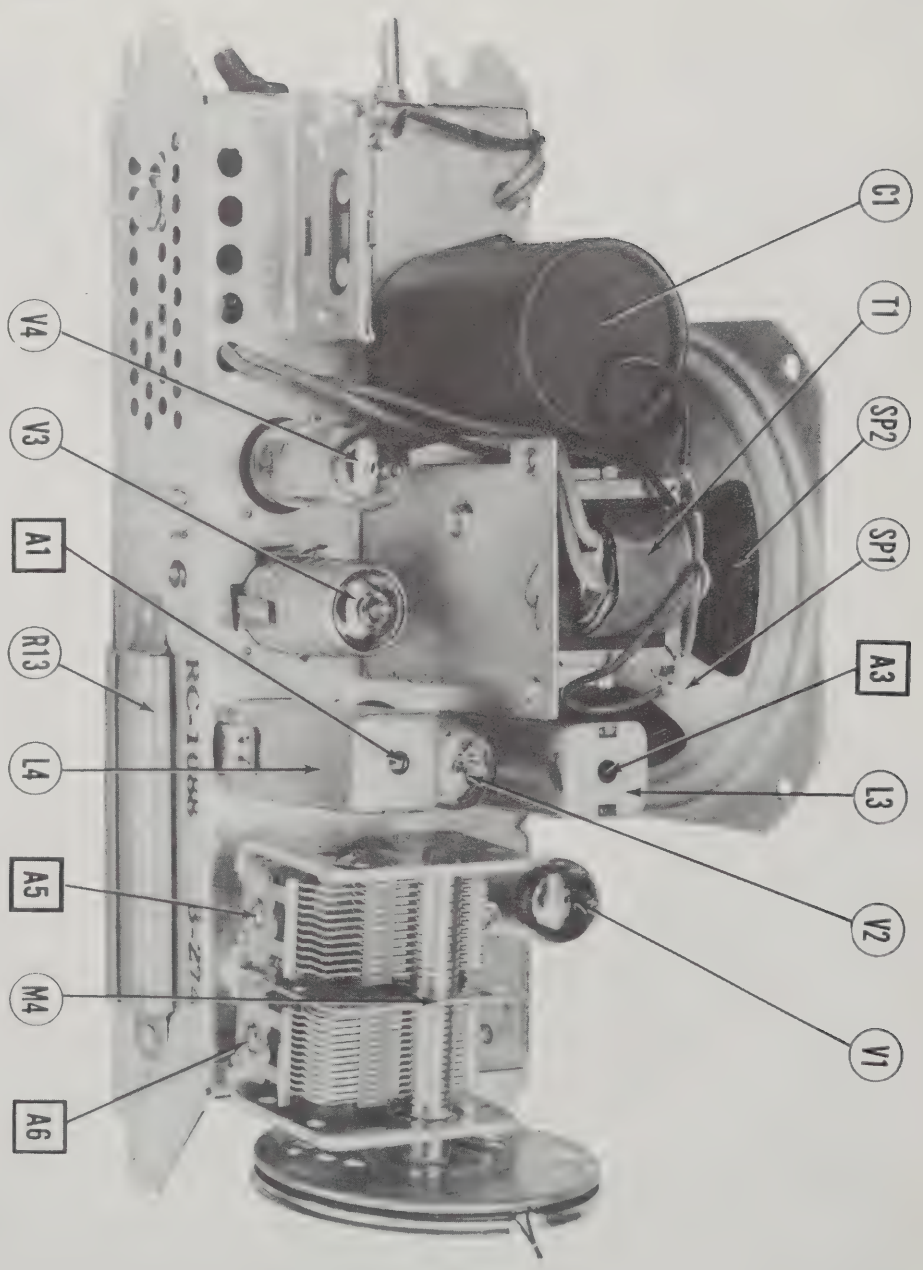
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	IRC PART No.	IDENTIFICATION CODES
R2	100KΩ	½		BTS-100K	Osc. Grid
R3	470Ω	½		BTS-470	Filament String
R4	47KΩ	½		BTS-47K	Diode Filter
R5	22KΩ	½		BTS-22K	Screen Dropping
R6	3.9 Meg.	½		BTS-3.9 Meg.	AVC Network
R7	10 Meg.	½		BTS-10 Meg.	AF Grid
R8	10 Meg.	½		BTS-10 Meg.	AF Screen
R9	1 Meg.	½		BTS-1 Meg.	AF Plate
R10	470KΩ	½		BTS-470K	Output Grid
R11	680Ω	½		BTS-680	Filament String
R12	33Ω	1	73237		Surge Limiter-Wire Wound
R13A	1300Ω	3.5	74777		Filament Dropping-Wire Wound
B	1300Ω				Filament Dropping-Wire Wound
R14	2200Ω	½		BTS-2200	Filter
R15	4.7 Meg.	½		BTS-4.7 Meg.	IF Grid-See Note 1

Note 1. Used only in model BX-57

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1A	7900Ω	4.4Ω	425Ω	.5Ω	74779 ② 71047 ③	A-3329	A-2927 ①	RO-13	① Drill one new mounting hole. ② Used in BX-55 only. ③ Used in BX-57 only.
B									

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA RCA PART No.	JENSEN PART No.	QUAM PART No	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113 ①		
SP1	PM	4.4Ω	74165	MOD. P4-X	4A07 ①	① Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA PART No.	MEISSNER PART No.	
L1A	Loop Ant.	3.3Ω		74789		Model BX-55
B	Loop Ant.			75152		Model BX-57
L2A	Osc. Coil	2.5Ω	8.8Ω	74780	14-1074	Model BX-55
B	Osc. Coil			74405		Model BX-57
L3	1st IF	20Ω	20Ω	73129	16-6668	
L4A	2nd IF	40Ω	12.5Ω	74775	16-6669	Model BX-55
B	2nd IF	16Ω	16Ω	73130		Model BX-57

SELENIUM RECTIFIER

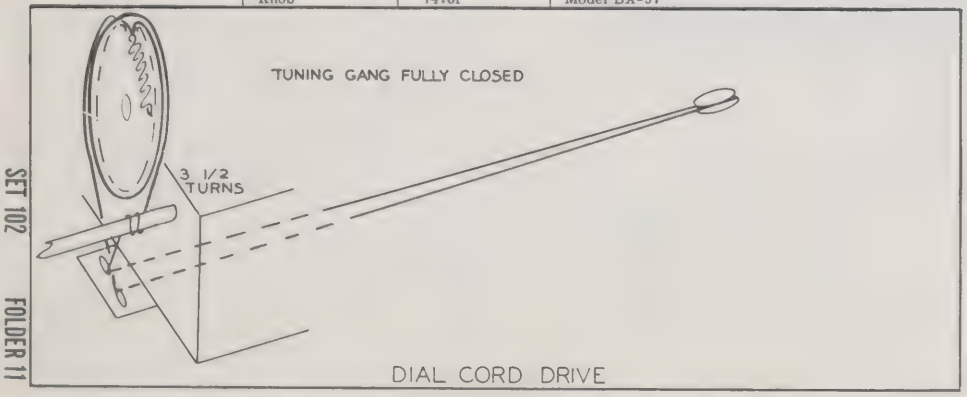
ITEM No.	RATING CURRENT	REPLACEMENT DATA RCA PART No.	SYLVANIA PART No.		NOTES
M1	.065ADC	74322	ND-5		

BATTERIES

ITEM No.	VOLTAGE	RCA PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	7.5V "A" 75V "B"	VS-050			755			T5Z50	

MISCELLANEOUS

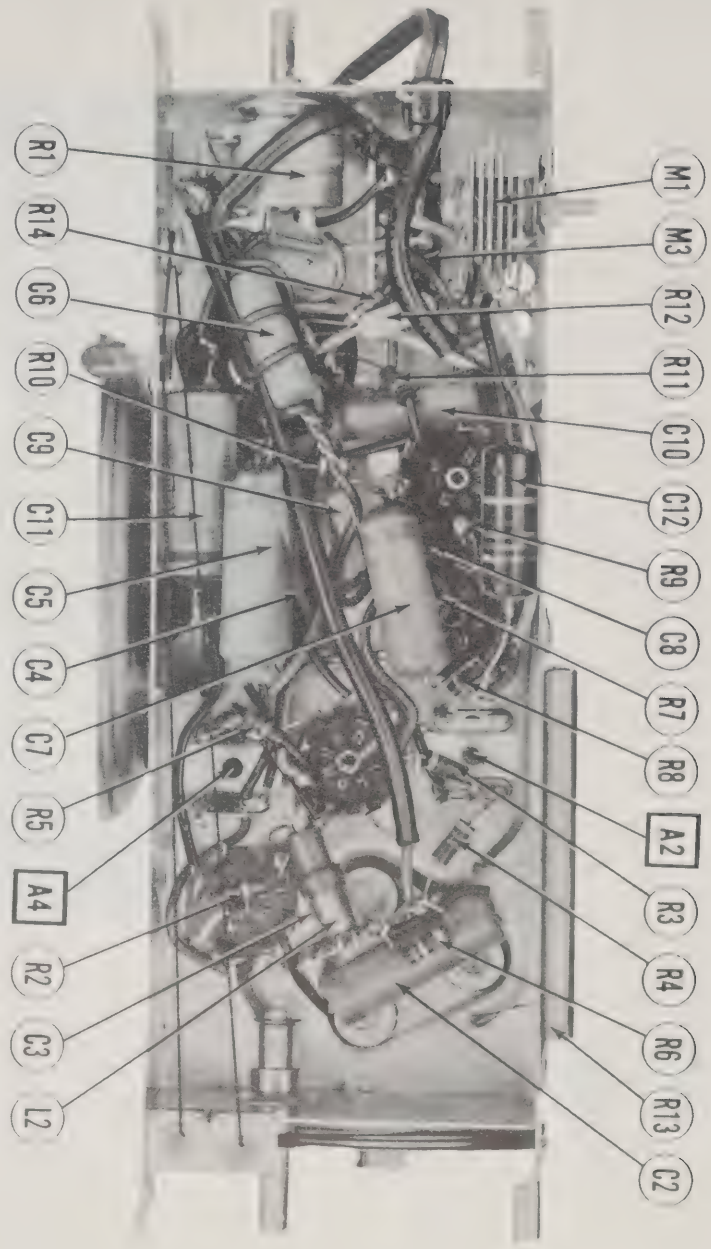
ITEM No.	PART NAME	RCA PART No.	NOTES
M3	Switch	71039	AC/DC-Battery
M4A	2 Gang Var. Cap.	74778	(23-422MMF, 25-182MMF)
B	2 Gang Var. Cap.	75149	Model BX-57
	Dial Pointer	74776	
	Dial Scale	74784	Model BX-55
	Dial Scale	75157	Model BX-57
	Knob	74666	Model BX-55
	Knob	74781	Model BX-57



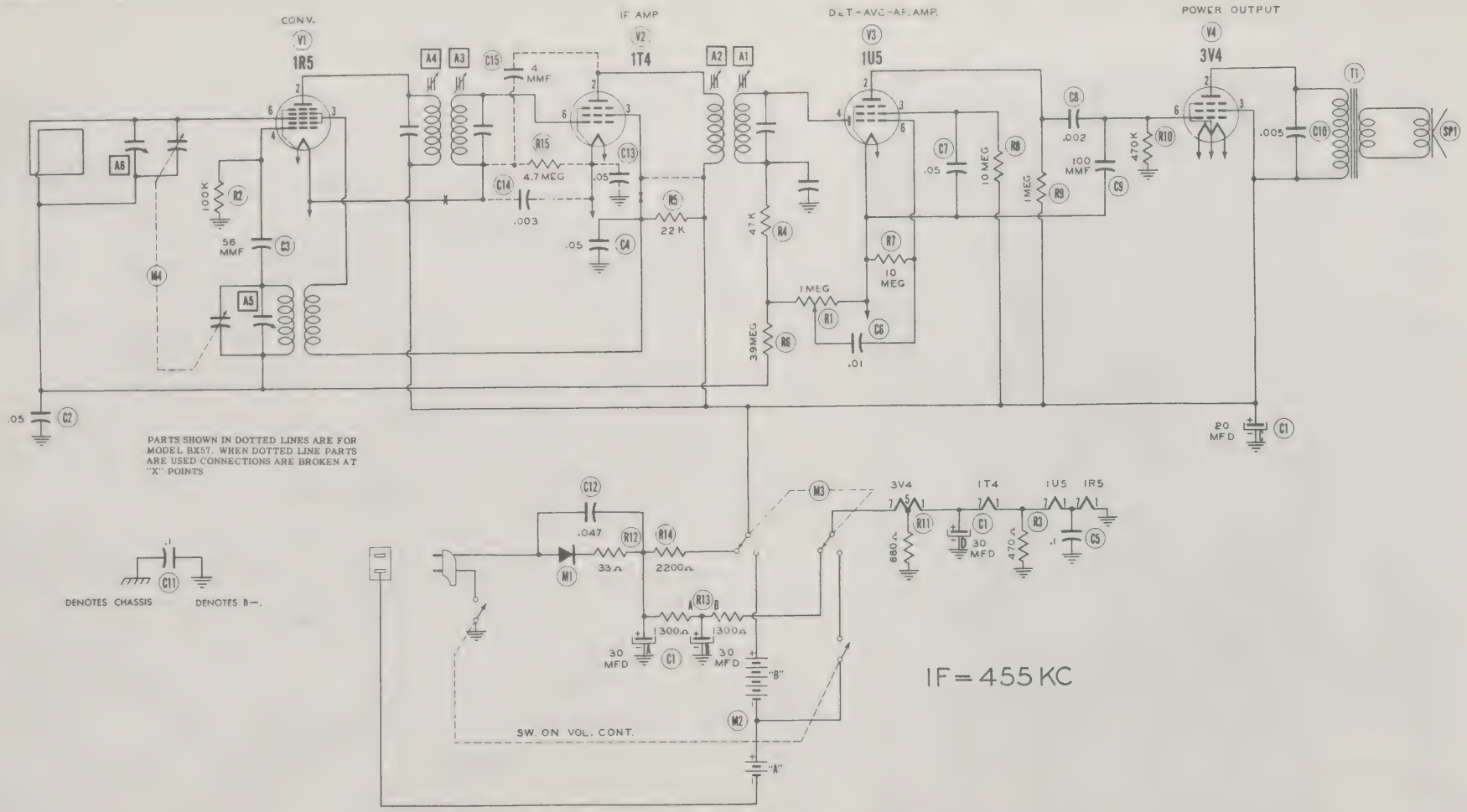
SET 102 FOLDER 11

RCA VICTOR MODEL BX55

CHASSIS—BOTTOM VIEW



RCA VICTOR MODEL BX55



VOLTAGE AND RESISTANCE READINGS TAKEN IN AC/DC POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0V.	95VDC	48VDC	§-8.7VDC	0V.	.1VDC	1.2VDC
V 2	1T4	2.4VDC	95VDC	48VDC	0V.	2.4VDC	1.2VDC	4VDC
V 3	1U5	1.2VDC	32VDC	10VDC	.2VDC	0V.	.1VDC	2.4VDC
V 4	3V4	4VDC	90VDC	95VDC	1.2VDC	5.2VDC	0V.	6.4VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.2KΩ	†24KΩ	100KΩ	*	4.9 Meg.	*
V 2	1T4	*	†2.2KΩ	†24KΩ	Inf.	*	*	*
V 3	1U5	*	†1 Meg.	†10 Meg.	1 Meg.	Inf.	10 Meg.	*
V 4	3V4	*	†2.6KΩ	†2.2KΩ	*	*	470KΩ	*

† MEASURED FROM OUTPUT OF M1.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1950

102-11

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

SILVERTONE MODELS

101, 101A, 108 (CH. 549.100, -1)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

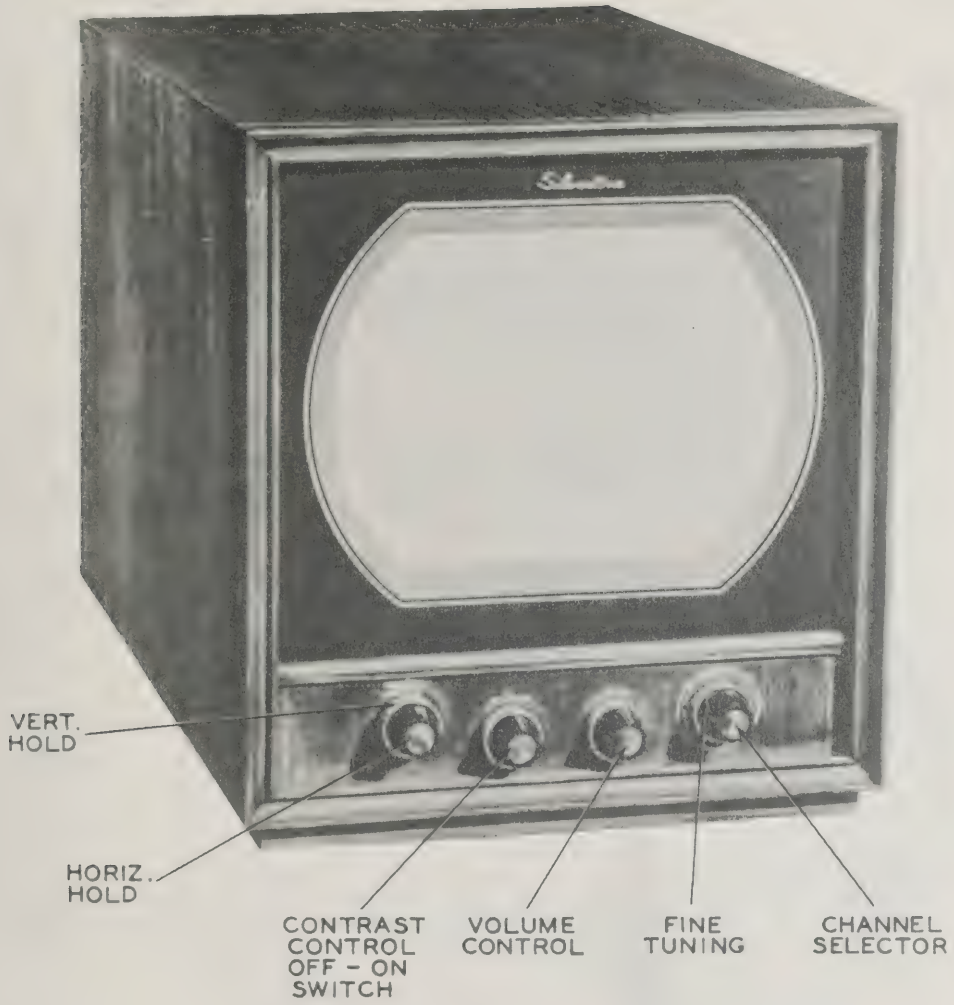
MODEL 101

SILVERTONE MODELS
101, 101A, 108 (CH. 549.100, -1)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 7/50 Set No. 102—Folder No. 12



SILVERTONE MODEL 101

TRADE NAME	Silvertone, Models 101, 101A, 108 (Chassis 549.100, 549.100-1)
SUPPLIER	Sears Roebuck and Co., 925 S. Homan St., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.35 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

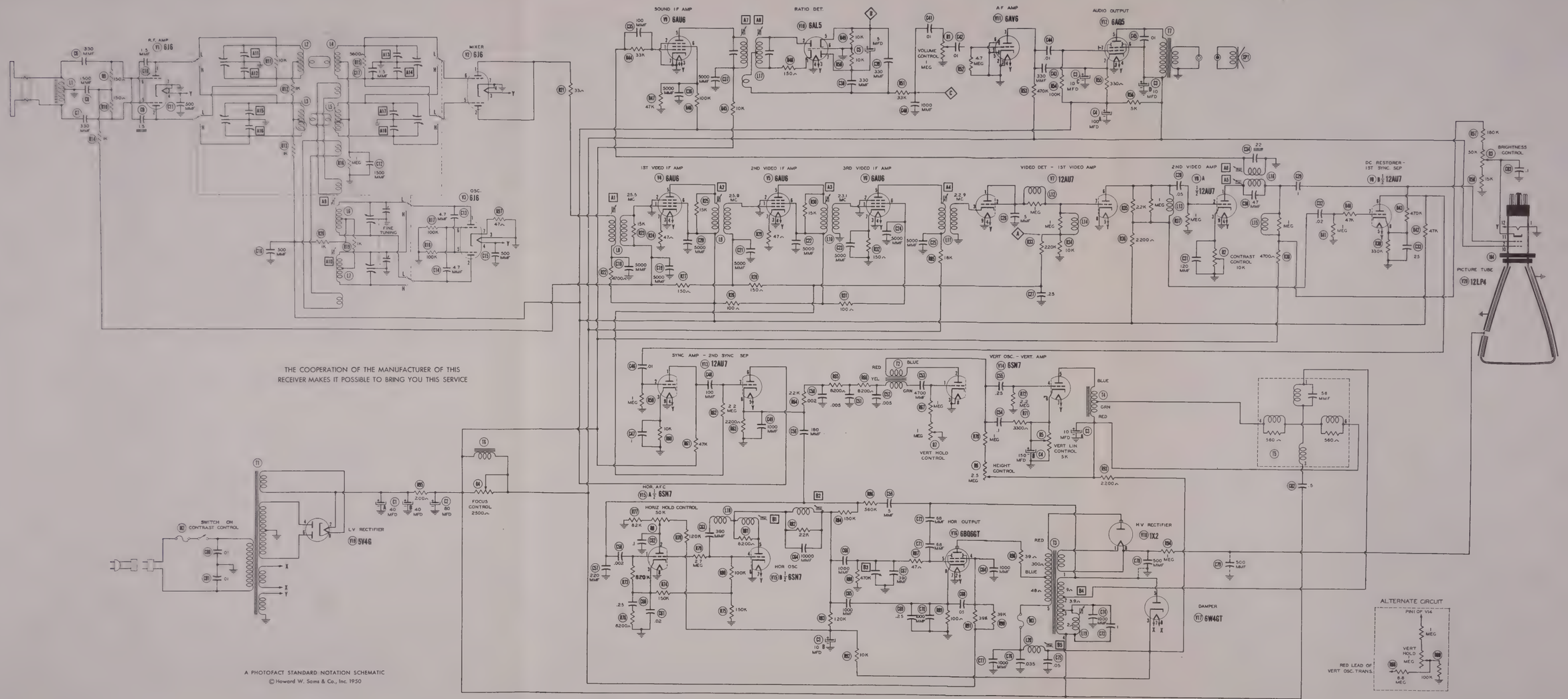
INDEX

Alignment Instructions 6
Block Diagram 13
Disassembly Instructions 10
Horiz. Osc. and Linearity Adjustments 10
Parts List and Description 14, 15, 16
Photographs
Cabinet-Rear View 10
Capacitor Identification 11, 18
Photographs (continued)
Chassis-Top View 3
RF Tuner 7
Resistor Identification 12, 17
Trans., Inductor and Alignment Identification 4, 9
Schematic 2
Tube Placement Chart 5
Voltage and Resistance Measurements 8

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

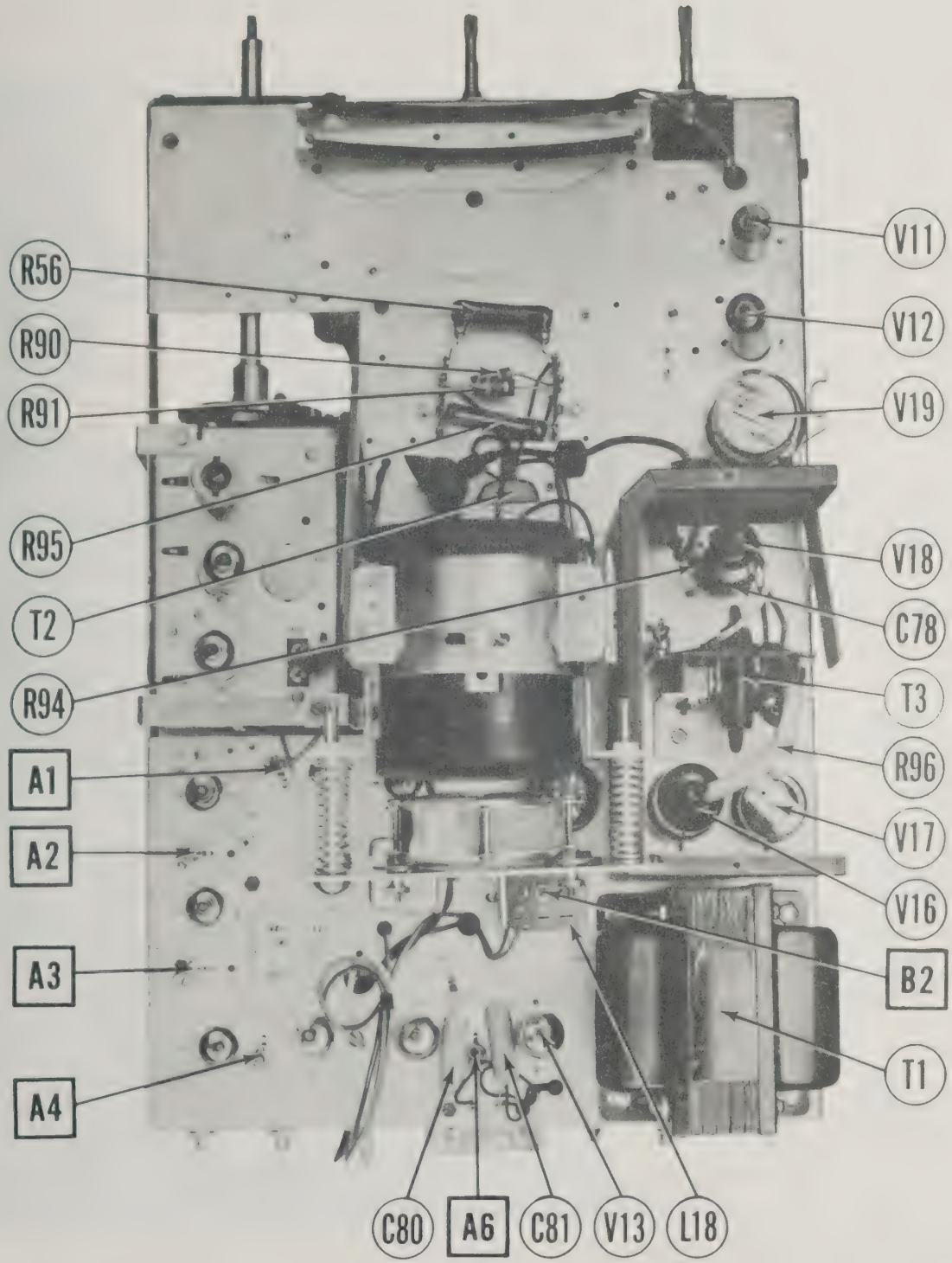
SILVERTONE MODELS
101, 101A, 108 (Ch. 549.100, -1)



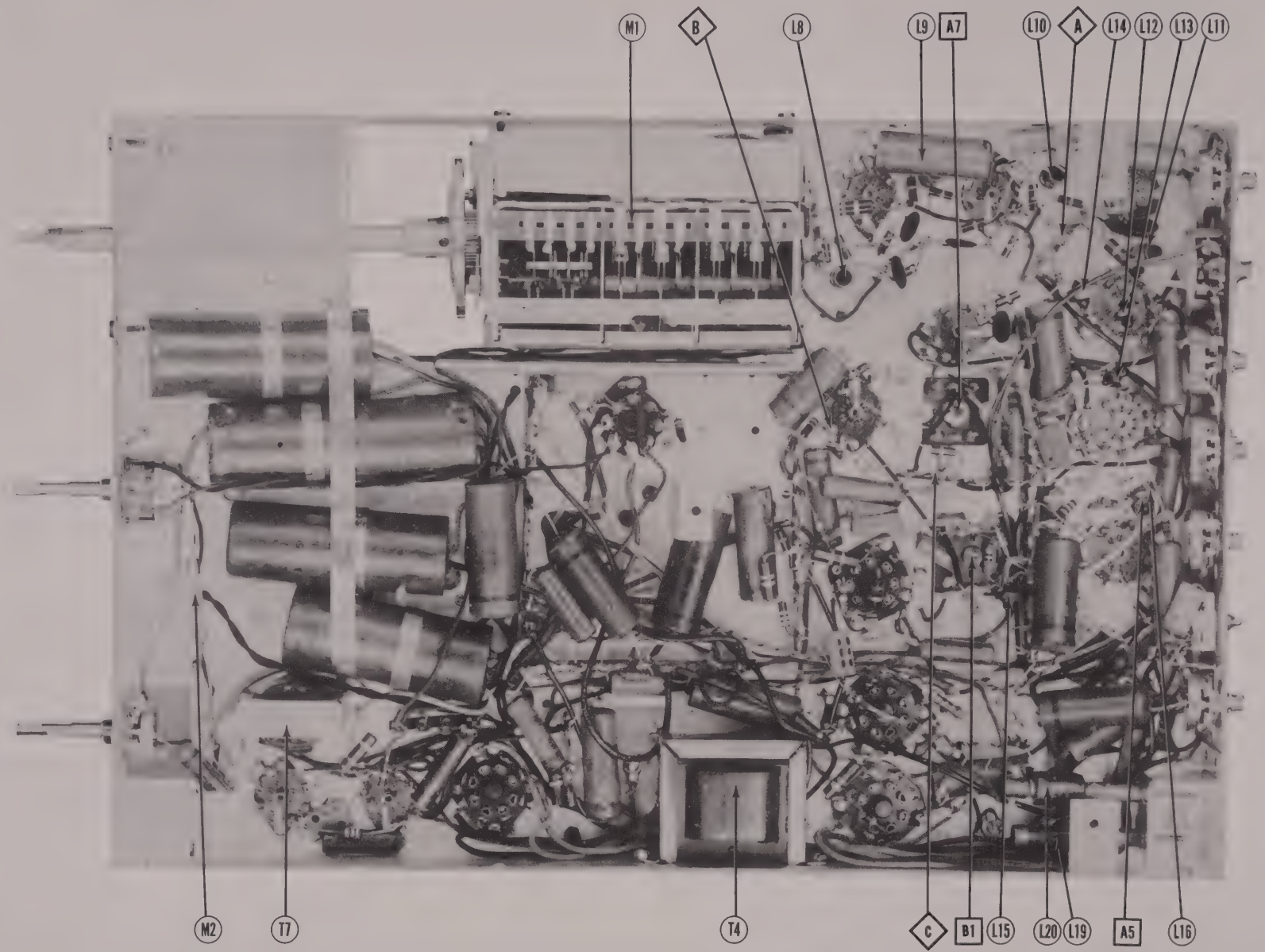
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

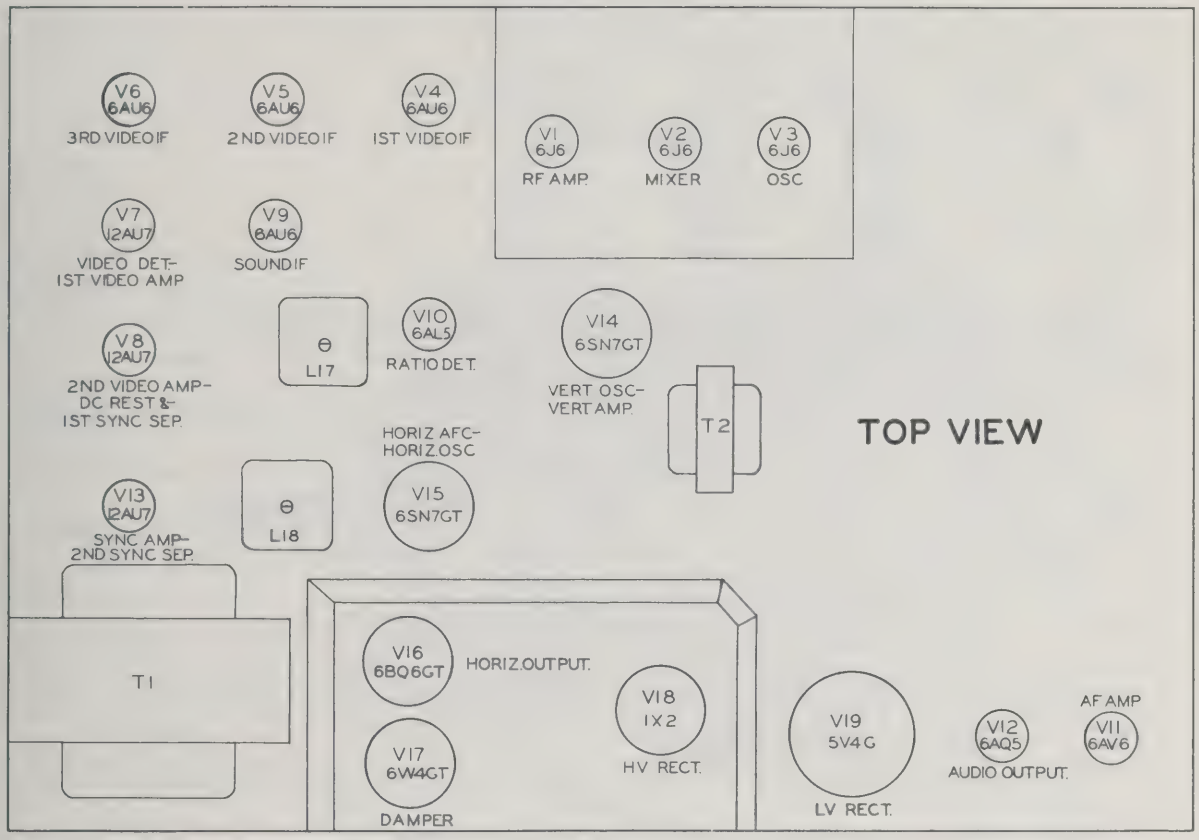
© Howard W. Sams & Co., Inc. 1950

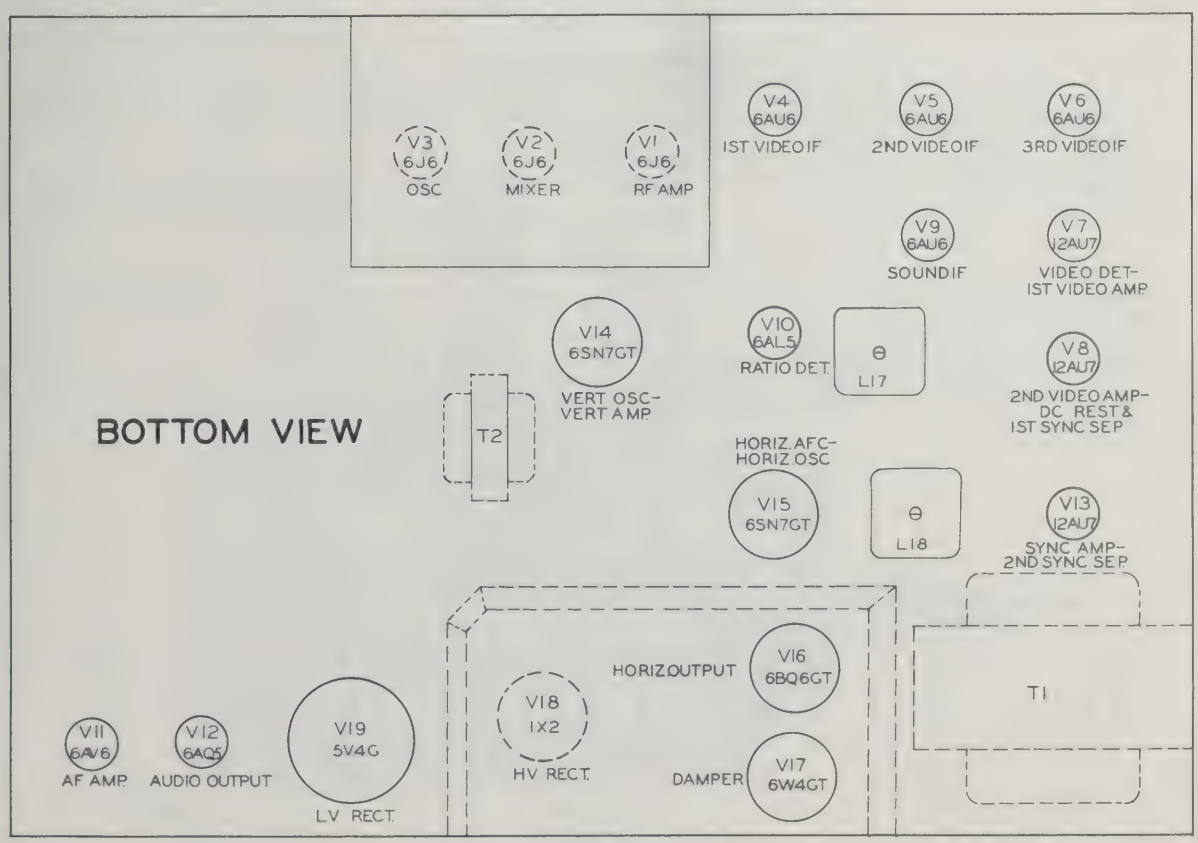


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard and remove the horizontal oscillator tube (V15) from its socket.

VIDEO IF ALIGNMENT

Remove the local oscillator (V3) to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25.5MC (Unmod.)	Any	DC Probe to Point (A) Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	24.9MC	"	"	A2	"
3.	Direct	"	23.1MC	"	"	A3	"
4.	Direct	"	22.9MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	23MC (10MC SWP)	21.75MC 26.25MC	Any	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig 1. If necessary retouch A1 thru A4 for optimum response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (B) Common to chassis.	A5, A6, A7	Adjust for maximum deflection. Attenuate signal generator to maintain 2 volt reading.
7.	.01MFD	"	"	"	DC Probe to Point (C) Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any channel not used locally	Vert. Amp. to Point (B) Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per Fig 2.
7.	.01MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A8	Reconnect capacitor C5. Adjust A8 so 4.5MC occurs at center of crossover lines as per Fig 3. Slightly retouch A7 for maximum amplitude and straightness of crossover lines

OSCILLATOR ALIGNMENT

The local oscillator operates 24.5MC below the center frequency of each channel, therefore is necessary to use a 24.5MC "BFO" generator to obtain a zero beat with the center frequency of the channel. Loosely couple the "BFO" generator to the video detector (V7). There are no oscillator adjustments for the individual channels. The oscillator is adjusted for the low channels on channel 2, and for the high channels on channel 7. Replace tube V3.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	BFO GEN. FREQUENCY	ADJUST	REMARKS
8.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	57MC (Unmod.)	2	24.5MC	A9	Connect a .01 capacitor between pin 2 (Grid) of the picture tube and pin 1 (Grid) of the first audio tube (V11). Adjust for rough audio beat note in the speaker.
9.	"	"	177MC	7	"	A10	"

RF ALIGNMENT

The RF and Mixer lines of this receiver are pre-set at the factory and are normally very stable. Alignment should not be attempted unless they are definitely known to be out of alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	85MC (Unmod.)	6	DC Probe to Point (A) Common to chassis.	A11, A12, A13, A14	Adjust for maximum deflection. Keep trimmer pairs at approximately the same relative position.
11.	"	"	213MC (Unmod.)	13	"	A15, A16, A17, A18	"

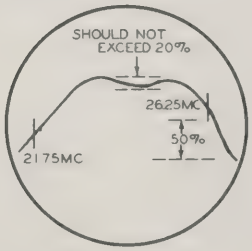


FIG. 1

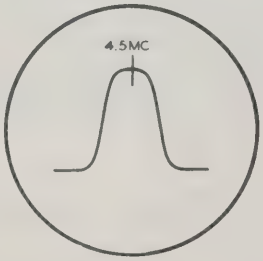


FIG. 2

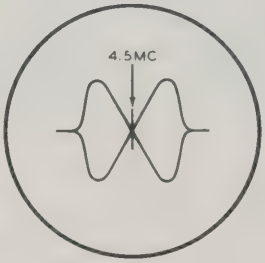
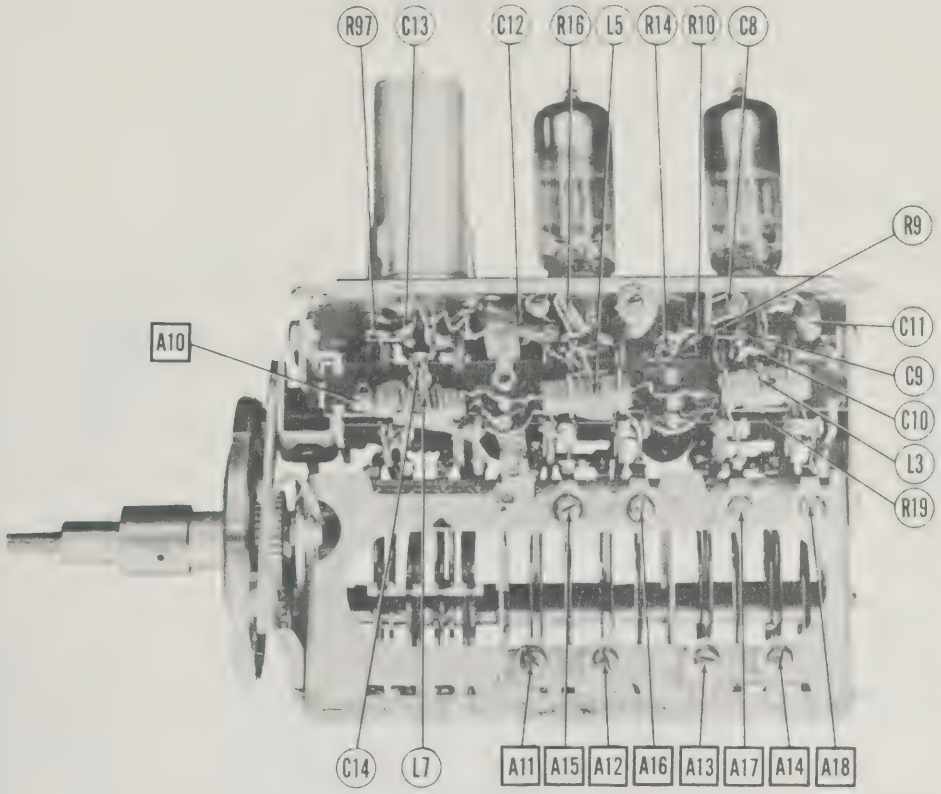
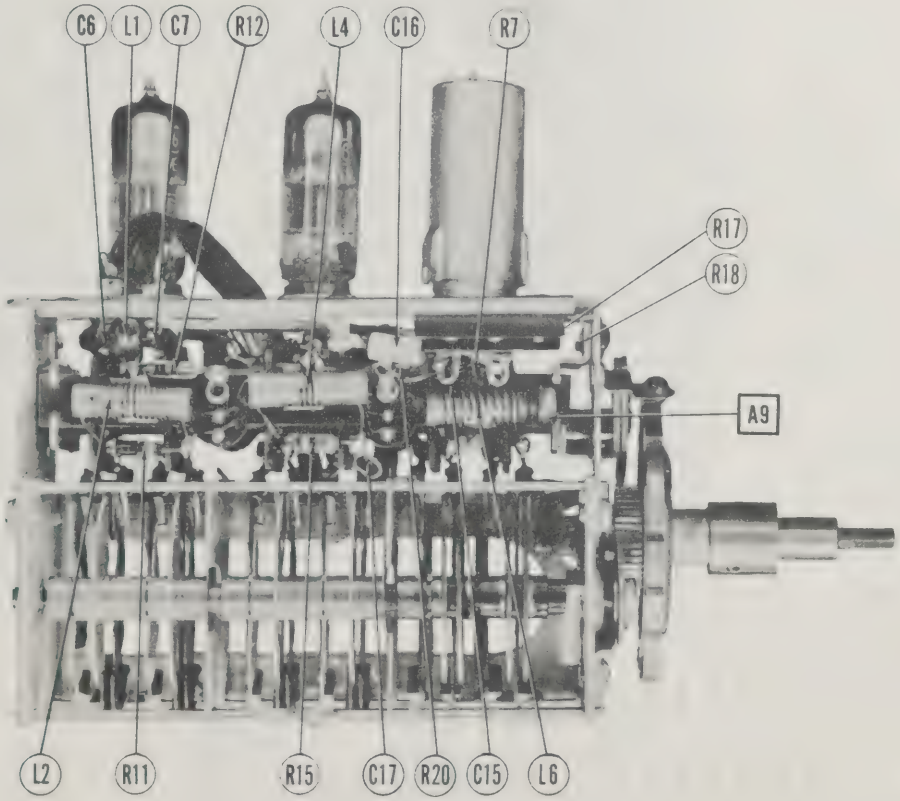


FIG. 3



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	95VDC	95VDC	0V.	6.3VAC	-.2VDC	-.3VDC	0V.		
V 2	6J6	95VDC	95VDC	6.3VAC	0V.	-2.4VDC	-2.6VDC	0V.		
V 3	6J6	100VDC	100VDC	0V.	6.3VAC	§-3.8VDC	§-4.2VDC	0V.		
V 4	6AU6	-2.6VDC	0V.	0V.	6.3VAC	122VDC	122VDC	.4VDC		
V 5	6AU6	-.6VDC	0V.	0V.	6.3VAC	120VDC	120VDC	.4VDC		
V 6	6AU6	0V.	0V.	0V.	6.3VAC	235VDC	125VDC	1.1VDC		
V 7	12AU7	-.4VDC	-.4VDC	0V.	6.3VAC	6.3VAC	100VDC	-.4VDC	0V.	0V.
V 8	12AU7	310VDC	0V.	16VDC	6.3VAC	6.3VAC	120VDC	0V.	8.8VDC	0V.
V 9	6AU6	-.4VDC	0V.	6.3VAC	0V.	300VDC	33VDC	0V.		
V 10	6AL5	0V.	0V.	6.3VAC	0V.	.2VDC	0V.	-.2VDC		
V 11	6AV6	-.4VDC	0V.	0V.	6.3VAC	0V.	0V:	85VDC		
V 12	6AQ5	♦0V.	♦110VDC	0V.	6.3VAC	200VDC	210VDC	♦0V.		
V 13	12AU7	260VDC	0V.	12VDC	6.3VAC	6.3VAC	122VDC	0V.	4.5VDC	0V.
V 14	6SN7GT	-4.3VDC -4.7VDC	50VDC 155VDC	0V.	0V.	400VDC	0V. 20VDC	6.3VAC	0V.	
V 15	6SN7GT	-30VDC	120VDC 205VDC	-20VDC	-55VDC	175VDC	0V.	6.3VAC	0V.	
V 16	6BQ6GT	0V.	6.3VAC	410VDC	120VDC	-10VDC	320VDC	0V.	7.6VDC	TOP CAP *
V 17	6W4GT	380VDC	420VDC	420VDC	0V.	320VDC	200VDC	¶	¶	
V 18	1X2	* DO NOT MEASURE.								
V 19	5V4G	0V.	360VDC	0V.	325VAC	0V.	325VAC	0V.	360VDC	
V 20	12LP4	0V.	2.5VDC	PIN 10 120VDC	PIN 11 18VDC 80VDC	PIN 12 6.3VAC				

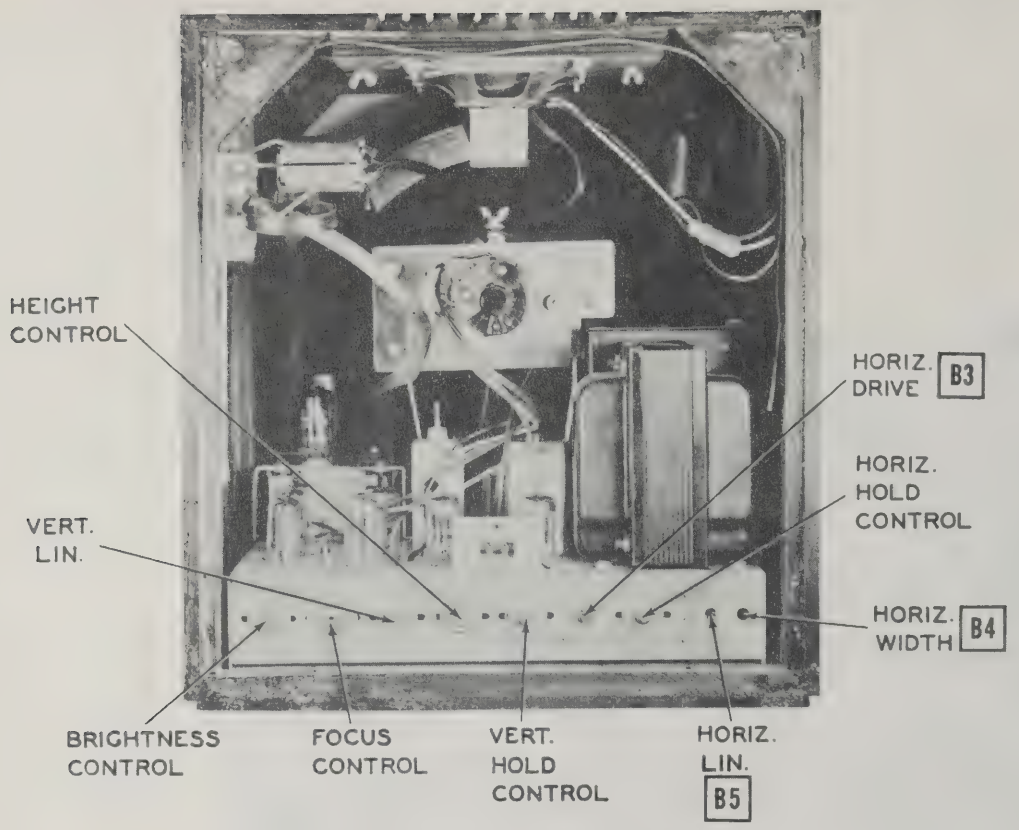
§ TAKEN WITH VACUUM TUBE VOLTMERTER.
* DO NOT MEASURE.
♦ MEASURED FROM PIN 6 OF V4.
¶ 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†6KΩ	†6KΩ	0Ω	.1Ω	230KΩ	230KΩ	0Ω		
V 2	6J6	†10KΩ	†10KΩ	.1Ω	0Ω	1 Meg.	1 Meg.	0Ω		
V 3	6J6	†6KΩ	†6KΩ	0Ω	.1Ω	100KΩ	100KΩ	47Ω		
V 4	6AU6	230KΩ	0Ω	0Ω	.1Ω	†5KΩ	†5KΩ	47Ω		
V 5	6AU6	230KΩ	0Ω	0Ω	.1Ω	†5KΩ	†5KΩ	47Ω		
V 6	6AU6	.2Ω	0Ω	0Ω	.1Ω	†18KΩ	†5KΩ	150Ω		
V 7	12AU7	10KΩ	10KΩ	.2Ω	.1Ω	.1Ω	†7.2KΩ	10KΩ	0Ω	0Ω
V 8	12AU7	†4KΩ	1 Meg.	10KΩ	.1Ω	.1Ω	†50KΩ	1 Meg.	330KΩ	0Ω
V 9	6AU6	33KΩ	0Ω	.1Ω	0Ω	†10KΩ	†50KΩ	0Ω		
V 10	6AL5	Inf.	Inf.	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 11	6AV6	4.7 Meg.	0Ω	0Ω	.1Ω	0Ω	0Ω	†470KΩ		
V 12	6AQ5	♦100KΩ	♦330Ω	0Ω	.1Ω	†800Ω	†450Ω	♦100KΩ		
V 13	12AU7	†47KΩ	1 Meg.	10KΩ	.1Ω	.1Ω	†5KΩ	2.3 Meg.	2.2KΩ	0Ω
V 14	6SN7GT	2.4 Meg. 1.1 Meg.	#3.5 Meg. #1 Meg.	0Ω	2.2Meg.	#2.8KΩ	5KΩ 5Ω	.1Ω	0Ω	
V 15	6SN7GT	1 Meg.	#150KΩ #120KΩ	300KΩ	250KΩ	#110KΩ	0Ω	.1Ω	0Ω	
V 16	6BQ6GT	Inf.	.1Ω	#38Ω	†19KΩ	470KΩ	†200Ω	0Ω	100Ω	TOP CAP #130Ω
V 17	6W4GT	140KΩ	150KΩ	180KΩ	Inf.	†200Ω	140KΩ	Inf.	Inf.	
V 18	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #410Ω
V 19	5V4G	Inf.	40KΩ	Inf.	45Ω	Inf.	41Ω	Inf.	40KΩ	
V 20	12LP4	0Ω	800KΩ	PIN 10 †500Ω	PIN 11 42KΩ 15KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V19.
# MEASURED FROM PIN 3 OF V17.
♦ MEASURED FROM PIN 6 OF V4.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET-REAR VIEW

HORIZONTAL OSCILLATOR ADJUSTMENTS

Connect a short across terminals "C and D" of L18.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Remove the short and connect the vertical amplifier of an oscilloscope to terminal "D" of L18.

Adjust the waveform adjustment slug (B2) until the broad and sharp peaks are of equal amplitude as shown in figure 4. If necessary, readjust the hold control so picture remains in sync.

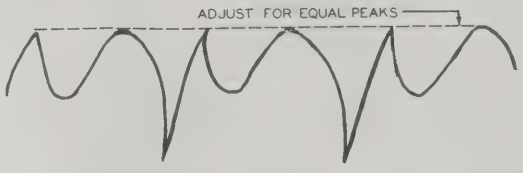


FIG. 4

HORIZONTAL LINEARITY ADJUSTMENTS

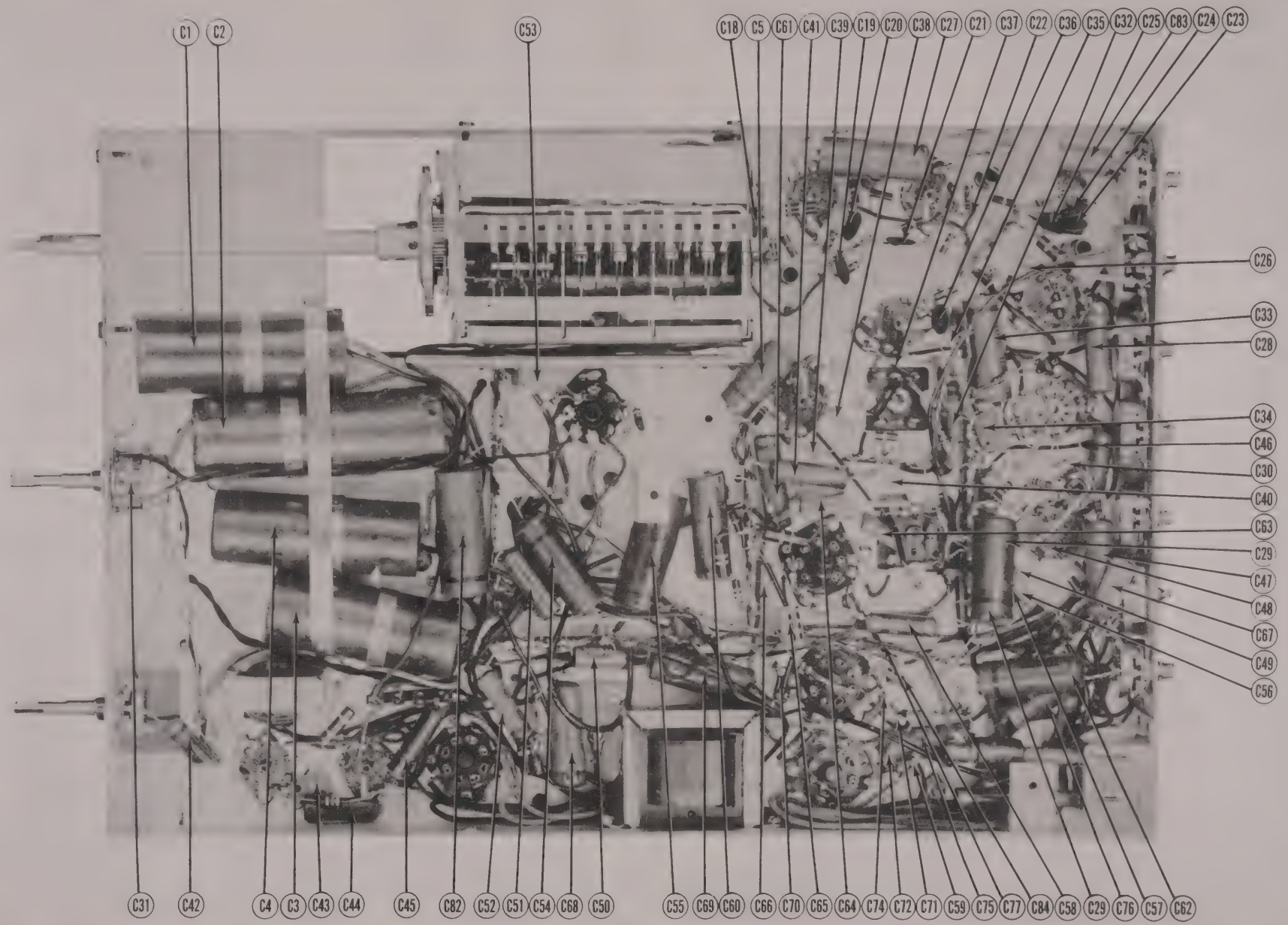
Turn the horizontal drive trimmer (B3) clockwise as far as possible without causing fold-over in the raster.

Adjust the width slug (B4) until the picture fills the mask horizontally.

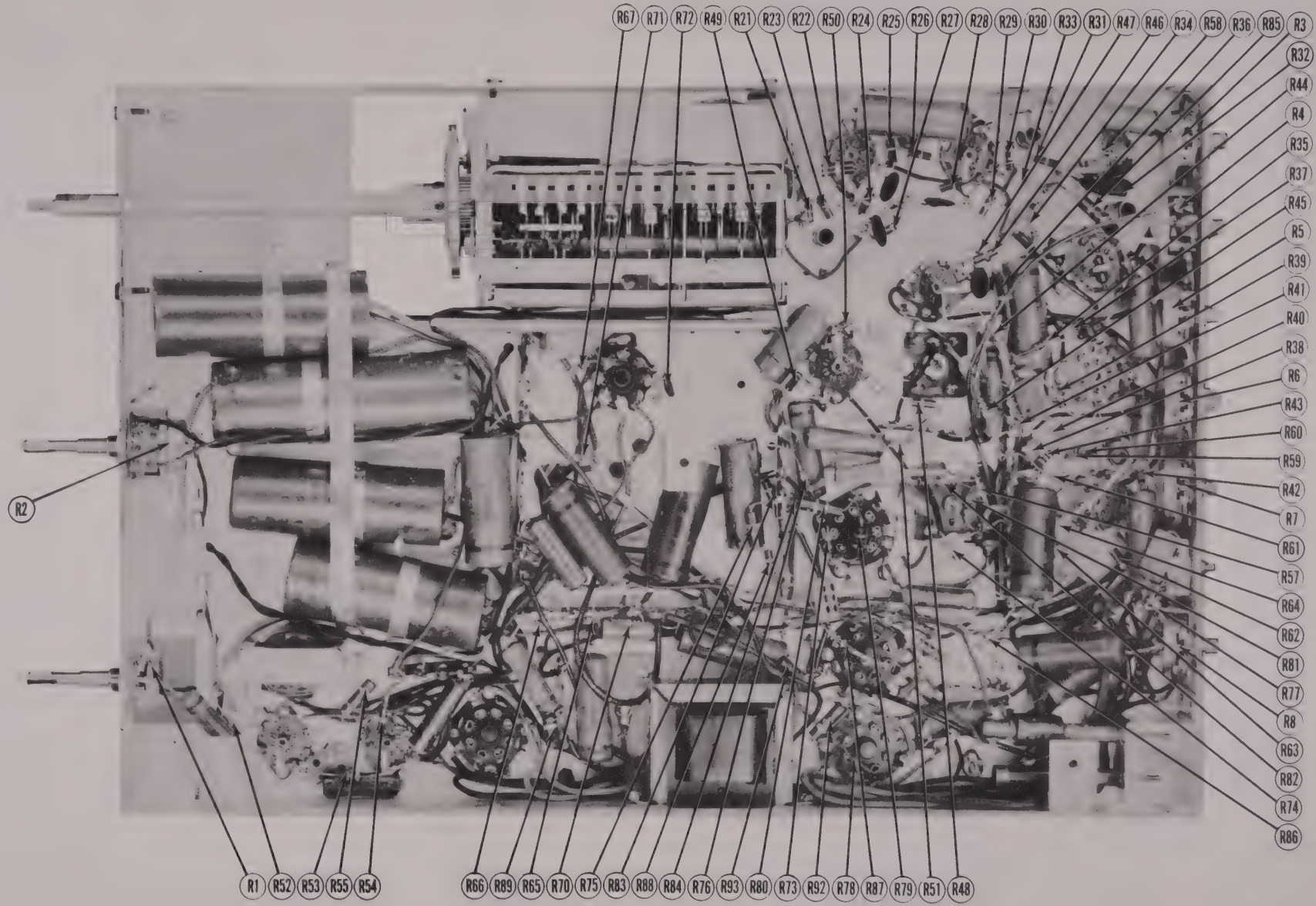
Adjust the horizontal linearity slug (B5) until the picture is symmetrical from left to right. Readjustment of B3 may be necessary while making this adjustment.

DISASSEMBLY INSTRUCTIONS

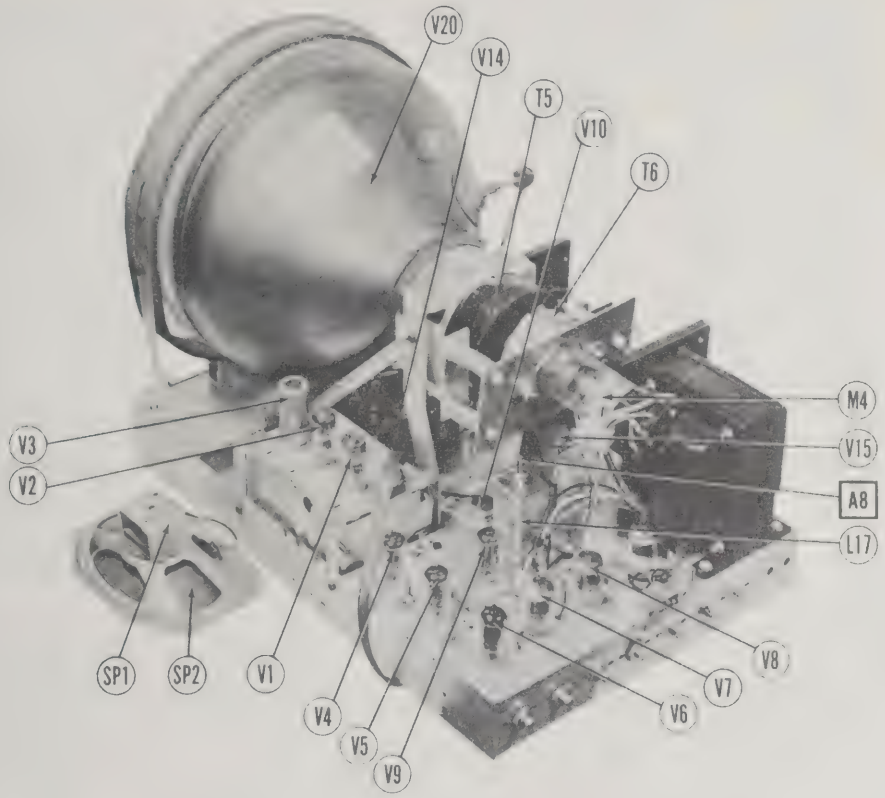
1. Remove three front and one side push-on type control knobs.
2. Remove seven phillips head screws and one 1/4" hex head bolt holding rear cover. Remove cover.
3. Disconnect speaker plug.
4. Remove two wing nuts holding speaker mounting board. Remove speaker on board.
5. Loosen antenna terminal screws and remove built-in antenna if used.
6. Remove two phillips head screws holding antenna terminal strip.
7. Remove one 1/2" hex nut holding antenna trimmer. Remove trimmer from mounting and push aside.
8. Remove five screws holding TV chassis. Remove chassis.



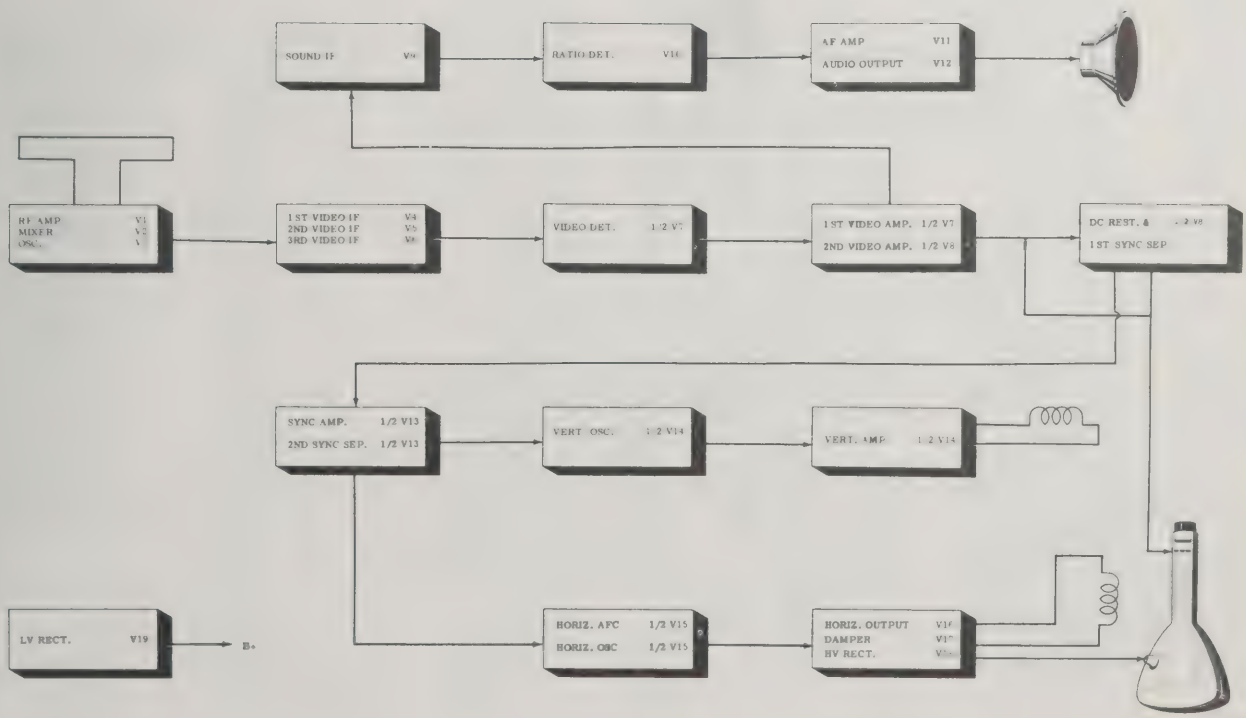
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS-TOP VIEW



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6J6	6J6	7BF	
V2	Mixer	6J6	6J6	7BF	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det.-1st Video Amp.	12AU7	12AU7	9A	
V8	2nd Video Amp.-DC Restorer-1st Sync. Sep.	12AU7	12AU7	9A	
V9	Sound IF	6AU6	6AU6	7BK	
V10	Ratio Det.	6AL5	6AL5	6BT	
V11	AF Amp.	6AV6	6AV6	7BT	
V12	Audio Output	6AQ6	6AQ6	7BZ	
V13	Sync. Amp.-2nd Sync. Sep.	12AU7	12AU7	9A	
V14	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V15	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1X2	1X2	7CB	
V19	LV Rectifier	5V4G	5V4G	5L	
V20	Picture Tube	12LP4	12LP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	45B137	PRSA450/40-40		EDJ10118		TVL-64#	Filter-Red
B	40	450							Filter-Red
C2	80	450	45B158	PRSA450/40-40		EZ10074		TVL-9#	Filter
C3A	10	450	45B157	PRSA2222J		EZ10114		TVL-39#	Decoupling-Red
B	10	450							Decoupling-Red
C	10	450							Output Cathode Bypass-Blue
D	10	450							Decoupling-Yellow
C4A	100	250	45B156	PRSA20F30B					Decoupling-Red
B	150	50							Decoupling-Red
C5	5	50	45A109	PRS150/4		BR550		TVA-13	Vert. Output Cath. Byp. -Yel. Stabilizing Cap.
C6	330		47B20331K5	GP330M	D6-331		GP2K-330		RF Coupling
C7	330		47B20331K5	GP330M	D6-331		GP2K-330		RF Coupling
C8	1500		47B20152K5	GP1500M	D6-152		GP2L-0015		AGC Filter
C9	1.5		47A160-3	CH.5CNPO	TCZ-1.5		NPOK-1.5		Neutralizing
C10	1.5		47A160-3	CH.5CNPO	TCZ-152		NPOK-1.5		Neutralizing
C11	500		47B20501K5	GP500M	D6-501		GP2K-500		RF Filament Bypass
C12	1500		47B20152K5	GP1500M	D6-152		GP2L-0015		Mixer Grid Filter
C13	4.7		47A160-6	CN4.7DN750			N750K-5		Osc. Feedback
C14	4.7		47A160-6	CN4.7DN750			N750K-5		Osc. Feedback
C15	500		47B20501K5	GP500M	D6-501		GP2K-500		Osc. Filament Bypass
C16	500		47B20501K5	GP500M	D6-501		GP2K-500		RF Bypass
C17	1.5		47A160-3	CH.5CNPO	TCZ-1.5		NPOK-1.5		Fixed Trimmer
C18	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	Mixer Plate Decoupling
C19	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	AGC Filter
C20	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	1st V. IF Decoupling
C21	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	AGC Filter
C22	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	2nd V. IF Decoupling
C23	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	3rd V. IF Cathode Bypass
C24	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	3rd V. IF Decoupling
C25	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	3rd V. IF Plate Decoupling
C26	5		47B20050K5		TCZ-4.7	5W5V5	NPOK-5	MS-55	V. Diode Filter
C27	.25	200	46AT254J	P488-25		GT2P25		TC-2	AGC Filter
C28	.05	200	46AY503J	P288-05	DF-503	PTE4S1		TM-15	Video Coupling
C29	.1	600	46AU104J	P688-1	DF-104	PTE4P1		TM-1	Video Coupling
C30	47			CN47JNPO	TCZ-47	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C31	120	500	47X20A121M	1468-00015	D6-121	5W5T15	GP2K-120	1FM-315	2nd V. Amp. Cathode Byp.
C32	.02	400	46AY203J	P488-02	DF-203	PTE4S2		TM-12	Video Coupling
C33	.25	200	46AT254J	P488-25		GT2P25		TC-2	DC Res. Cathode Bypass
C34	22	500	47X20A220K	1469-000025	TCZ-22		GP1K-22	MS-425	Fixed Trimmer
C35	100		47X20A101M	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	S. IF Coupling
C36	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	S. IF Screen Bypass
C37	5000		47A168	BPD-5	DD-502	1D5D5	811-005	29C1	S. IF Plate Decoupling
C38	330		47B20331K5	GP330M	D6-331	5W5T3	GP2K-330	1FM-335	Diode Load Cap. *
C39	330		47B20331K5	GP330M	D6-331	5W5T3	GP2K-330	1FM-335	Diode Load Cap. *
C40	1000		47B20102M5	GP1000M	D6-102	PTE4S1	GP2L-001	1FM-21	De-emphasis
C41	.01	200	46AU502J	P488-01	D6-103	PTE4S1		TM-11	Audio Coupling †
C42	.01	400	46AU103J	P488-01	D6-103	PTE4S1	821-01	TM-11	Audio Coupling
C43	330	500	47X20A331M	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	AF Amp. Plate Bypass
C44	.01	600	46AY103J	P688-01	D6-103	PTE6S1	821-01	TM-11	Audio Coupling
C45	.01	600	46AY103J	P688-01	D6-103	PTE6S1	821-01	TM-11	Output Plate Bypass
C46	.01	200	46AU103J	P488-01	D6-103	PTE4S1	821-01	TM-11	Sync. Coupling
C47	.1	200	46AU104J	P288-1	DF-104	PTE4P1		TM-1	2nd Sync. Amp. Cath. Byp.
C48	100		47X20A101M	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	Sync. Coupling
C49	1000	500	47X20A102M	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	2nd Sync. Sep. Cath. Byp.
C50	.002	600	46AZ202J	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Integrator Net.
C51	.005	200	46AU502J	P488-005	D6-502	PTE6D5	811-005	TM-25	Integrator Net.
C52	.005	600	46AU502J	P688-005	D6-502	PTE6D5	811-005	TM-25	Integrator Net.
C53	4700	500	47X35A472M	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C54	.1	600	46AU104J	P688-1		PTE6P1		TM-1	Vert. Discharge
C55	.25	600	46AX254J	684-25		GT6P25		TC-2	Vert. Sweep Coupling
C56	180	500	47X20A181M	1468-0002	D6-181	5W5T2	GP2K-180	1FM-32	Hor. Sync. Coupling
C57	220	500	4720A221M	1468-00025	D6-221	5W5T25	GP2K-220	1FM-335	Voltage Divider

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58	.002	600	46AZ202J	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Hor. Sync. Coupling
C59	5		47B20050K5	CI5DNPO	TCZ-4.7	5W5V5	NPOK-5	MS-55	Hor. Feedback
C60	.25	200	46AT254J	P488-25		GT2P25		TC-2	AFC Filter
C61	.02	600	46AY203J	P688-02	DF-203	PTE6S2		TM-12	AFC Filter
C62	.1	600	46AU104J	P688-1	DF-104	PTE6P1		TM-1	AFC Plate Bypass
C63	390	500	47X20A391M	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Osc. Grid Cap.
C64	10000	300	47X35A103K	1467-01	D6-103	1D5S1	821-01	1FM-11	Fixed Trimmer
C65	1000	500	47X20A102M	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Discharge
C66	1000	500	47X20A102M	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sweep Coupling
C67	390	500	47X20A391M	1468-0004	D6-391		GP2K-390	1FM-34	Voltage Divider
C68	.05	600	47AY503J	P688-05	DF-503	PTE6S5		TM-15	Hor. Output Screen Bypass
C69	.25	200	46AT254J	P488-25		GT2P25		TC-2	Hor. Output Cathode Bypass
C70	1000		47B20102M5	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Output Cathode Bypass †
C71	68			GP68M	D6-680	1W5T7	GP1K-68	MS-47	Hor. Feedback
C72	68			GP68M	D6-680	1W5T7	GP1K-68	MS-47	Hor. Feedback
C73	.1	200	46AU104J	P288-1		PTE4P1		TM-1	Fixed Trimmer
C74	1000		47B20102M5	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Fixed Trimmer †
C75	.05	600	46AY503J	P688-05		PTE6S5		TM-15	Damper Filter
C76	.035	600	46AY353J	P688-033					Damper Filter
C77	1000		47B20102M5	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Damper Filter †
C78	500	20000	47A216						HV Filter
C79	500	20000	47A216						HV Filter
C80	.01	600	46BR103L6	P688-01	D6-103	PTE6S1	821-01	TM-11	Line Filter
C81	.01	600	46BR103L6	P688-01	D6-103	PTE6S1	821-01	TM-11	Line Filter
C82	.5	200	46AT254J	P288-5		GT2P25		TC-5	Hor. Sweep Coupling §
C83	.1	200	46AU104J	P288-1	DF-104	PTE4P1		TM-1	Pic. Tube Cathode Decoupling
C84	1000		47B20102M5	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Output Screen Bypass †

* When either item C38 or C39 are replaced, replace both with capacitors of equal value.
† Some models use .05MFD in this application.
‡ Not used in all models.
§ Some models use .25MFD in this application.
# Use mounting strap.
♦ Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	25A856 *	Q13-137	AM-63-Z	AN-70	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions.
R2	10KΩ	2	25B790		25B790		Contrast Control and Switch - Wire Wound
R3A	50KΩ	½	25A858 *	Q11-123	M-44-S	AN-31	Brightness Control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R3A per instructions.
R4	2500Ω	2	25B710	W-3000	43-3000	V-3000	Focus Control - Wire Wound
R5A	5000Ω	½	25B712	Q11-114	M-19-S	AN-10	Vert. Linearity Control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R5A per instructions.
R6A	2.5Meg.	½	25B711	Q11-239	M-84-S	AN-83	Height Control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R6A per instructions.
R7A	1 Meg.	½	25A857 †	Q11-137	M-61-S	AN-69	Vert. Hold Control
B	Shaft		Not. Req.	Not Req.	Not Req.	AK-1	Attach to R7A per instructions.
R8A	50KΩ	½	25A858 †	Q11-123	M-44-S	AN-31	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R8A per instructions.

* Model 101A uses a dual concentric brightness and volume control (Part No. 25B874)
† Some models use dual concentric hold controls (Part No. 25B861) located on front panel of receiver.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R9	150Ω	½	23X20X151K		RF Grid
R10	150Ω	½	23X20X151K		RF Grid
R11	10KΩ	½	23X20X103K	BTS-10K	RF Plate Coil Shunt
R12	1000Ω 20%	½	23X20X102K	BTS-1000	RF Plate
R13	1000Ω 20%	½	23X20X102K	BTS-1000	RF Plate
R14	1000Ω 20%	½	23X20X102K	BTS-1000	AGC Network
R15	5600Ω	½	23X20X562K	BTS-5600	Mixer Grid Shunt
R16	1 Meg. 20%	½	23X20X105K	BTS-1 Meg.	Mixer Grid
R17	100KΩ 20%	½	23X20X104K	BTS-100K	Osc. Grid
R18	100KΩ 20%	½	23X20X104K	BTS-100K	Osc. Grid
R19	1000Ω 20%	½	23X20X102K	BTS-1000	Osc. Plate
R20	1000Ω 20%	½	23X20X102K	BTS-1000	Osc. Plate
R21	33Ω		23X20X330K		Parasitic Supp.
R22	47000Ω	1	23X30X472K		Mixer Plate Decoupling
R23	15KΩ	½	23X20X153K		1st Video IF Transformer Shunt
R24	47Ω	½	23X20X470K		1st Video IF Cathode
R25	15KΩ	½	23X20X153K		2nd Video IF Transformer Shunt
R26	100Ω	½	23X20X101K		Decoupling
R27	150Ω	½	23X20X151K		AGC Network
R28	150Ω	½	23X20X151K		AGC Network
R29	47Ω	½	23X20X470K		2nd Video IF Cathode
R30	15KΩ	½	23X20X153K		3rd Video IF Transformer Shunt
R31	100Ω	½	23X20X101K		Decoupling
R32	150Ω	½	23X20X151K		3rd Video IF Cathode
R33	220KΩ	½	23X20X224K	BTS-220K	AGC Network
R34	10KΩ	½	23X20X103K	BTS-10K	Video Det. Load
R35	22KΩ	½	23X20X223K	BTS-22K	Peaking Coil Shunt
R36	2200Ω	1	23X30X222K	BTA-2200	1st Video Amp. Plate
R37	1 Meg. 20%	½	23X20X105M	BTS-1 Meg.	2nd Video Amp. Grid-See Note 1
R38	4700Ω	2	23X40X472K	BT-2-4700	2nd Video Amp. Plate
R39	330KΩ	½	23X20X334K	BTS-330K	DC Rest. Load
R40	47KΩ	½	23X20X473K	BTS-47K	1st Sync. Sep. Grid
R41	1 Meg. 20%	½	23X20X105M	BTS-1 Meg.	1st Sync. Sep. Grid
R42	47KΩ	½	23X20X473K	BTS-47K	1st Sync. Sep. Plate-See Note 4
R43	470KΩ 20%	½	23X20X474M	BTS-470K	Picture Tube Grid
R44	33KΩ	½	23X20X333K	BTS-33K	Sound IF Grid
R45	10KΩ	½	23X20X103K	BTS-10K	Sound IF Plate Decoupling
R46	100KΩ 20%	½	23X20X104M		Sound IF Screen
R47	47KΩ	½	23X20X473K	BTS-47K	Voltage Divider
R48	150Ω	½	23X20X151K		Balancing

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES
R49	10KΩ 5%	½	23X20X103J	BTS-10K-5%	Ratio Det. Diode Load
R50	10KΩ 5%	½	23X20X103J	BTS-10K-5%	Ratio Det. Diode Load
R51	33KΩ	½	23X20X333K	BTS-33K	De-emphasis
R52	4.7Meg. 20%	½	23X20X475M	BTS-4.7 Meg.	AF Grid
R53	470KΩ 20%	½	23X20X474M	BTS-470K	AF Plate
R54	100KΩ 20%	½	23X20X104M	BTS-100K	Output Grid
R55	330Ω	1	23X30X331K	BTA-330	Output Cathode
R56	5000Ω	10	24BG502E	AB-5000	Filter-Wire Wound
R57	180KΩ	½	23X20X184M	BTS-180K	Voltage Divider
R58	15KΩ	½	23X20X153K	BTS-15K	Voltage Divider-See Note 5
R59	1 Meg. 20%	½	23X20X105M	BTS-1 Meg.	Sync. Amp. Grid
R60	10KΩ	½	23X20X103K	BTS-10K	Sync. Amp. Cathode
R61	47KΩ	½	23X20X473K	BTS-47K	Sync. Amp. Plate
R62	2.2 Meg.	½	23X20X225K	BTS-2.2 Meg.	2nd Sync. Sep. Grid
R63	2200Ω	½	23X20X222K	BTS-2200	2nd Sync. Sep. Cathode
R64	22KΩ	½	23X20X223K	BTS-22K	Integrator
R65	8200Ω	½	23X20X822K	BTS-8200	Integrator
R66	8200Ω	½	23X20X822K	BTS-8200	Integrator
R67	1 Meg.	½	23X20X105K	BTS-1 Meg.	Vert. Osc. Grid-See Note 2
R68	6.8 Meg.	½	23X20X685M	BTS-6.8 Meg.	Voltage Divider-See Note 3
R69	100KΩ	½	23X20X104K	BTS-100K	Voltage Divider-See Note 3
R70	1 Meg.	½	23X20X105M	BTS-1 Meg.	Vert. Osc. Plate
R71	33000Ω	½	23X20X332K	BTS-3300	Vert. Peaking
R72	2.2 Meg.	½	23X20X225M	BTS-2.2 Meg.	Vert. Amp. Grid
R73	820KΩ 20%	½	23X20X824M	BTS-820K	Horiz. AFC Grid
R74	150KΩ 20%	½	23X20X154M	BTS-150K	Horiz. AFC Cathode
R75	150KΩ	1	23X30X154M	BTA-150K	Horiz. AFC Cathode
R76	8200Ω	½	23X20X822K	BTS-8200	Horiz. AFC Filter Network
R77	82KΩ	½	23X20X823K	BTS-82K	Voltage Divider
R78	120KΩ 20%	½	23X20X124M	BTS-120K	Voltage Divider
R79	2.7 Meg.	1	23X30X275M	BTA-2.7 Meg.	Voltage Divider
R80	100KΩ	1	23X20X104K	BTA-100K	Horiz. Osc. Grid
R81	8200Ω	½	23X20X822K	BTS-8200	Horiz. Osc. Transformer Shunt
R82	22KΩ	½	23X20X223K	BTS-22K	Horiz. Osc. Transformer Shunt
R83	120KΩ 20%	½	23X20X124M	BTS-120K	Horiz. Osc. Plate
R84	150KΩ	1	23X20X154M	BTS-150K	Horiz. Osc. Filter Network
R85	18KΩ	1	23X30X183K	BTA-18K	Decoupling
R86	560KΩ	½	23X20X564K	BTS-560K	Feedback
R87	47Ω	½	23X20X470K		Parasitic Supp.
R88	470KΩ 20%	½	23X20X474M	BTS-470K	Horiz. Output Grid
R89	100Ω	1	23X30X10K	BW-1-100	Horiz. Output Cathode
R90	39KΩ	2	23X40X393K	BT-2-39K	Horiz. Output Screen
R91	39KΩ	2	23X40X393K	BT-2-39K	Horiz. Output Screen
R92	10KΩ	1	23X30X103K	BTA-10K	Filter
R93	2200Ω	1	23X30X222K	BTA-2200	Decoupling
R94	1 Meg.	1	23X30X105K		HV Filter
R95	200Ω	10	24BH20IE	AB-200	Filter-Wire Wound
R96	39Ω	½	23X30X390K		Parasitic Supp.-See Note 3
R97	47Ω	½	23X20X470K		Osc. Cathode
R98	56000Ω	1	23X30X562K	BTA-5600	Voltage Divider - See note 3

Note 1. Some models use 220KΩ resistor in this application.
Note 2. Some models use 1.2 Meg. resistor in this application.
Note 3. Not used in all models.
Note 4. Some models use 27KΩ resistor in this application.
Note 5. Some models use 22KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.35A	670VCT @ .170 ADC	5VAC @ 2A	6.3VAC @ 7.4A SEC. 4 6.3VAC @ 1.2A	52C185			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	200Ω	1200Ω	55B115	A-8111	A-3000	TBO-1	Vert. Block Osc. Trans.
T3	346Ω Tap @ 48Ω	SEC. 1 50 Tap @ .2Ω & 4.1Ω	55C133				Hor. Output Trans.
T4	1100Ω Tap @ 12.5Ω		55A128	A-8112	A-3037	TSO-5	Vert. Output Trans.
T5A	15Ω		53A180	DY-1			Hor. Deflection Coil
B	68Ω						Vert. Deflection Coil
T6	900Ω		51B1158				Focus Coil

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	6.6KΩ	3.5Ω	365Ω	.5Ω	55C134	A-3878	A-2931	RO-13	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	SILVERTONE PART No.	VIKING PART No.	QUAM PART No.	
SP1	PM	3.5Ω	85A095	46J6	46A1	
	CONE DIA.	V. C. DIA.				
SP2	3 7/8" x 5 7/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	
L1	Ant. Input	0Ω				Part of tuner.
L2	Ant. Coil	0Ω				Part of tuner, low-band
L3	Ant. Coil	0Ω				Part of tuner, high-band
L4	Mixer Grid	0Ω				Part of tuner, low-band
L5	Mixer Grid	0Ω				Part of tuner, high-band
L6	Osc. Coil	0Ω				
L7	Osc. Coil	0Ω				Part of tuner, low-band
L8	1st Video IF	.2Ω	.2Ω	50A431		Part of tuner, high-band
L9	2nd Video IF	.2Ω	.2Ω	50A431		
L10	3rd Video IF	.2Ω	.2Ω	50A431		
L11	4th Video IF	.2Ω	.2Ω	50A431		
L12	Peaking	8.5Ω		51B1154		Wound on 1 Meg. resistor.
L13	Peaking	8.5Ω		51B1154		Wound on 1 Meg. resistor.
L14	Peaking	17Ω		51A1155		Wound on 1 Meg. resistor.
L15	Peaking	10.5Ω		51A1156 †		Wound on 1 Meg. resistor.
L16	Sound IF	1Ω	.8Ω	50A432		
L17	Ratio Det. Trans.	4.5Ω	1Ω	50B406		
L18	Hor. Osc. Trans.	120Ω	36Ω	51B1153		
L19	Width Cont.	.2Ω		51B1072-1		
L20	Horiz. Linearity	38Ω		51B1071		
L21	Peaking			51A1156 †		

† Not used in all models.

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	RF Tuner	1C834	Complete
M2	Fuse	39A340	3A
M3	Fuse	39A338	.25A, 250V (Not used in all models)
M4	Ion Trap	21A093	Permanent Magnet Type
	Safety Glass	22D276	Models 101, 101A
	Saftey Glass	22D286	Model 108
	Trimmer	44A361	Horiz. Drive (B3)

PHOTOFACT* Folder

*TRADE MARK

SPARTON MODELS

5002, 5003, 5006, 5007

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 5006

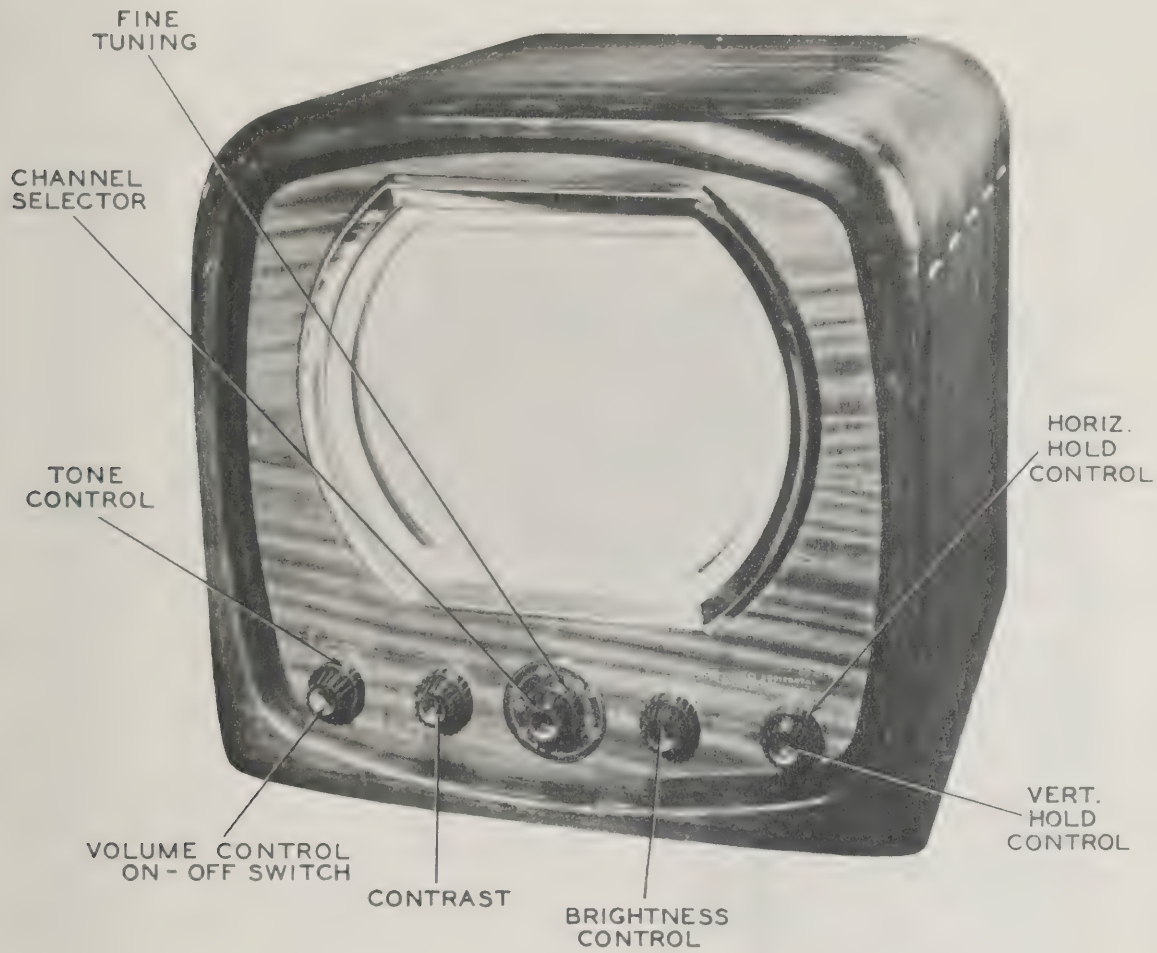
SPARTON MODELS
5002, 5003, 5006, 5007

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 7/50 Set No. 102—Folder No. 13

SPARTON MODELS 5002, 5003, 5006, 5007 (Ch. 23TD10)



SPARTON MODELS 5002, 5003, 5006, 5007 (Ch. 23TD10)

SPARTON MODEL 5006

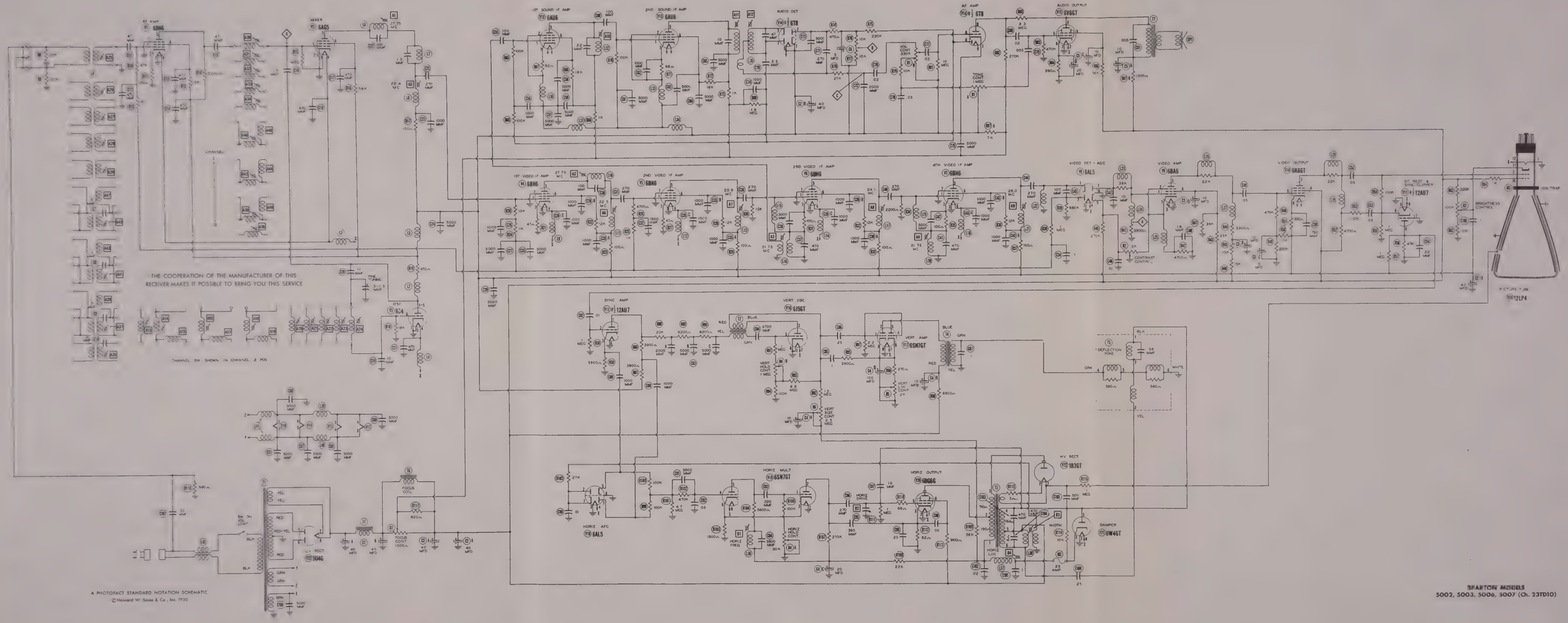
TRADE NAME	Sparton, Models 5002, 5003, 5006, 5007 (Chassis 23TD10)
MANUFACTURER	Sparks-Withington Co., Jackson, Michigan
TYPE SET	Television Receiver
TUBES	Twenty Four
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.9 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

INDEX

Alignment Instructions 6, 7, 8
Block Diagram 20
Disassembly Instructions 19
Horiz. Sweep Circuit Adjustment 19
Parts List and Description 14, 15, 16
Photographs
Cabinet-Rear View 19
Capacitor Identification 11, 18
Photographs (continued)
Chassis-Top View 3, 20
RF Tuner 13
Resistor Identification 12, 17
Trans., Inductor and Alignment Identification 4, 9
Schematic 2
Tube Placement Chart 5
Voltage and Resistance Measurements 10

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

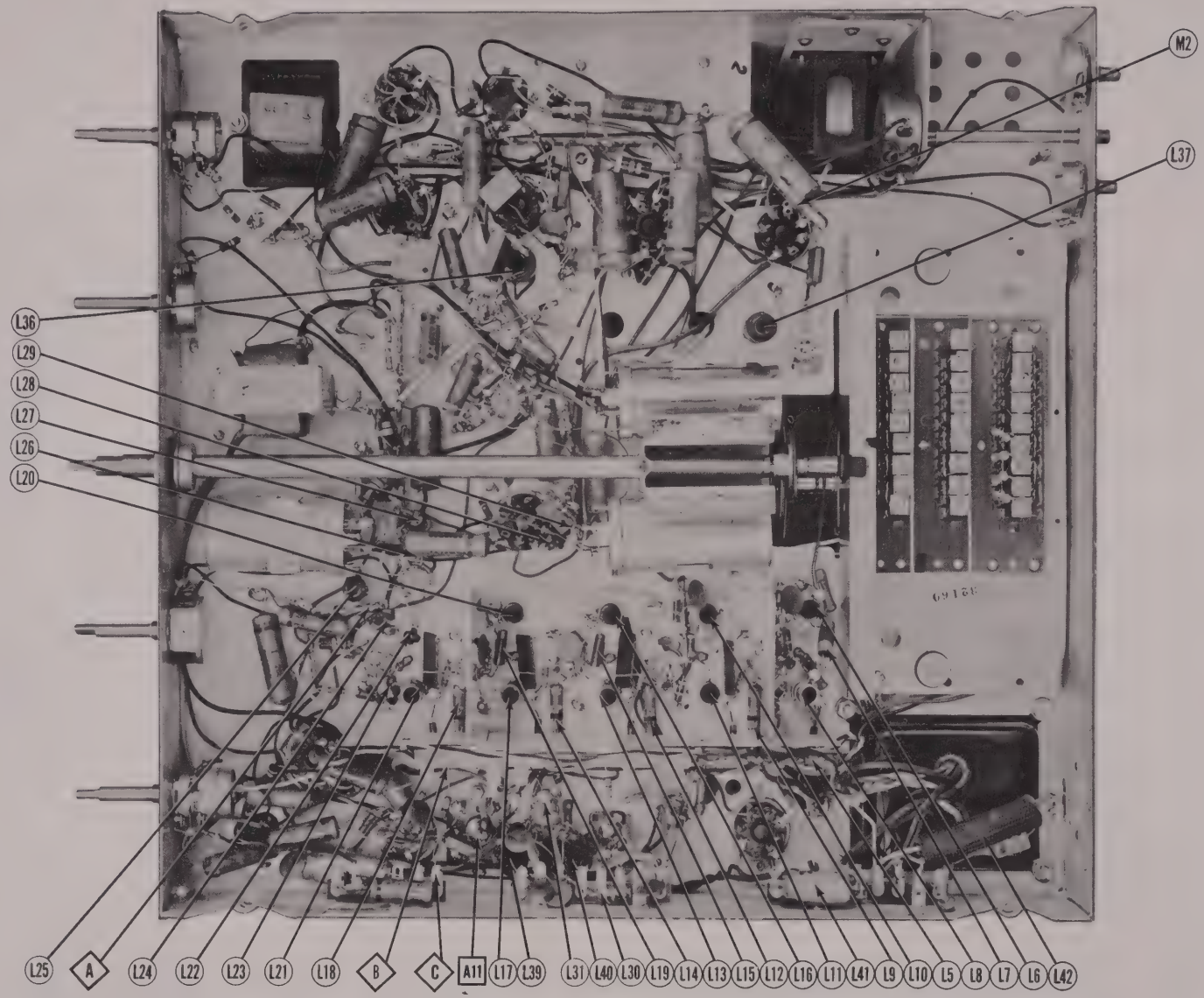


SPARTON MODELS
5002, 5003, 5006, 5007 (Ch. 23TD10)

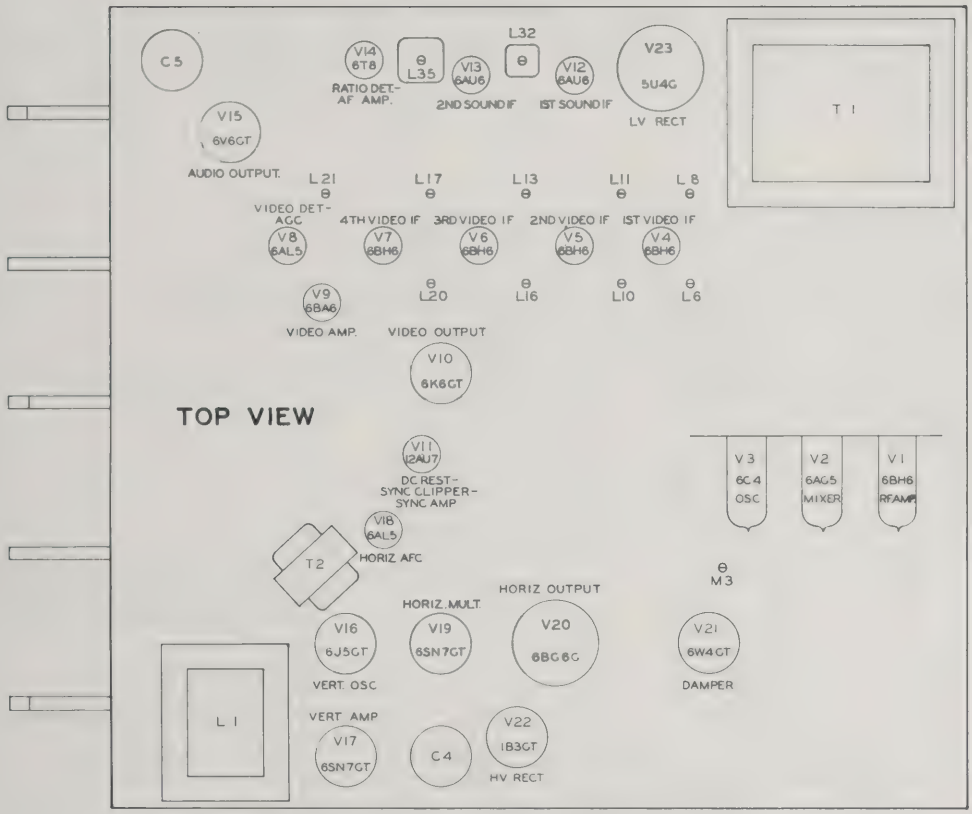
SPARTON MODELS
5002, 5003, 5006, 5007 (Ch. 23TD10)

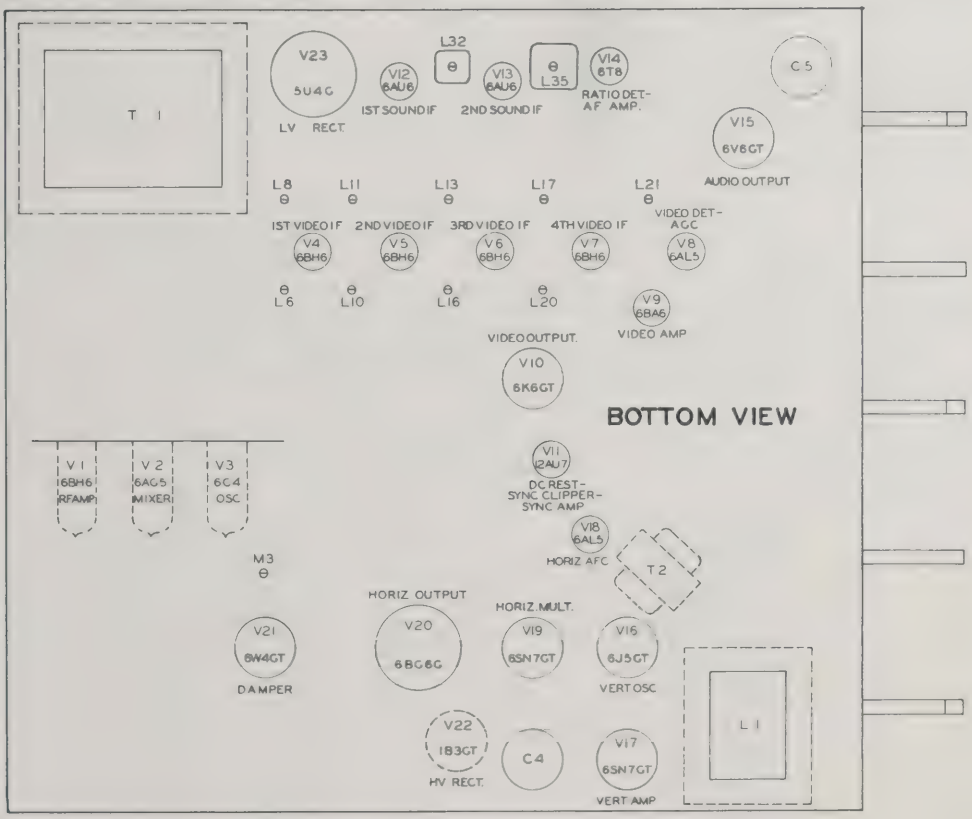
CHASSIS TOP VIEW

SPARTON MODELS
5002, 5003, 5006, 5007 (Ch. 23TD10)



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Before starting the alignment of this receiver, pre-set the controls as follows:
Picture Control to center position, Brightness Control to position where raster is visible,
Focus Control to position where focus is obtained, Vertical Hold to center position,
Vertical Linearity center position, Vertical Size to normal raster height, Horizontal Hold center position,

If the video IF channel is badly out of alignment and oscillating, it is recommended to pre-set the adjustments as follows to stop the oscillations.

"A" Adjustments	Slug Position
A1	Out
A2	Out
A3	In
A4	In
A5	In
A6	In
A7	Out
A8	Out
A9	Out

Remove the RF Amp. tube V1 and the oscillator tube V3 to prevent erroneous indications.

Also connect a 3 volt bias battery to the AGC buss. Negative to AGC line-positive to chassis.

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V19) from its socket.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	27.75MC	2	DC Probe to Point A . Common to chassis.	A1, A2	Adjust for MINIMUM deflection.
2.	"	"	21.75MC	"	"	A3, A4	"
3.	"	"	22.4MC	"	"	A5	Adjust for maximum deflection.
4.	"	"	22.5MC	"	"	A6	"
5.	"	"	25.9MC	"	"	A7	Adjust for maximum deflection. If when making this adjustment, the IF strip should start oscillating, turn A7 to point where oscillation ceases. Adjust A8 and A9 at their proper frequencies and then re-align A7.
6.	"	"	24.1MC	"	"	A8	Adjust for maximum deflection.
7.	"	"	26.0MC	"	"	A9	Adjust for maximum deflection. If overall IF response check is not being made, continue with step 9.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	24MC (10MC Sweep)	21.75MC 22.7MC 25.5MC 26.5MC 27.75MC	2	Vert. Amp. to Point A . Low side to chassis.	A1 thru A9	Observe pattern obtained to see that markers appear at proper points as per Fig 1. Slight readjustments may be necessary to obtain the proper pattern.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.75MC	2	Across capacitor C6	A10, A11	Adjust for maximum deflection.
10.	"	"	"	"	DC Probe to Point C Common to Point B	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. If A12 required much adjustment, A11 should be retouched for maximum.

OSCILLATOR ALIGNMENT

It is necessary that the sound IF system be accurately aligned before attempting alignment of the oscillator circuits.
Since small inductances are connected in series with the tuned circuits for channels 8, 10, and 12 to form the tuned circuits for channels 7, 9 and 11, the order of alignment is important. It is necessary to align the higher channel of each pair (7 and 8, 9 and 10, 11 and 12) first.
Insert V1 and V3 in the tuner which were removed for the Video and sound IF alignment and set the fine tuning control to the midpoint of its rotation.
The coils slugs are held in place with wax which must be removed when aligning the individual coil and should be replaced after alignment is completed.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Two 125Ω carbon res.	Insert 125Ω resistor in each lead and connect to antenna terminals.	215.75MC	13	DC Probe to Point C Common to Point B	A13	Adjust for ZERO reading.
12.	"	"	209.75MC	12	"	A14	"
13.	"	"	203.75MC	11	"	A15	Mechanically distort coil position for ZERO reading.
14.	"	"	197.75MC	10	"	A16	Adjust for zero reading.
15.	"	"	191.75MC	9	"	A17	Mechanically distort coil position for zero reading.
16.	"	"	185.75MC	8	"	A18	Adjust for zero reading.
17.	"	"	179.75MC	7	"	A19	Mechanically distort coil position for zero reading.
18.	"	"	87.75MC	6	"	A20	Adjust for zero reading.
19.	"	"	81.75MC	5	"	A21	Adjust for zero reading.
20.	"	"	71.75MC	4	"	A22	Adjust for zero reading.
21.	"	"	65.75MC	3	"	A23	Adjust for zero reading.
22.	"	"	59.75MC	2	"	A24	Adjust for zero reading.

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

In the event complete alignment of the RF Amp. and Mixer circuits is necessary, it is recommended that the complete tuner be returned to the factory for a replacement unit. If only one or two channels require adjustments, alignment for those channels may be performed.
Short the AGC line to chassis while aligning the RF circuits.
Keep signal generator output as low as possible and still give reading.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
23.	One 50Ω carbon res. & (2)125Ω carbon res.	Shunt generator with 50Ω resistor and insert 125Ω resistor in each lead. Connect across antenna terminal.	59.75MC	2	DC Probe to Point C. Common to Point B.		Adjust fine tuning control for zero reading.
24.	"	"	"	2	Across cap. C6	A25	Adjust for maximum deflection.
25.	"	"	65.75MC	3	DC Probe to Point C. Common to Point B.		Adjust fine tuning control for zero reading.
26.	"	"	"	3	Across cap C6	A26	Adjust for maximum deflection.
27.	"	"	71.75MC	4	DC Probe to Point C. Common to Point B.		Adjust fine tuning control for zero reading.
28.	"	"	"	4	Across cap. C6	A27	Adjust for maximum deflection.
29.	"	"	81.75MC	5	DC Probe to Point C. Common to Point B.		Adjust fine tuning control for zero reading.
30.	"	"	"	5	Across cap. C6	A28	Adjust for maximum deflection.
31.	"	"	87.75MC	6	DC Probe to Point C. Common to Point B.		Adjust fine tuning control for zero reading.
32.	"	"	"	6	Across cap. C6	A29	Adjust for maximum deflection.
33.	"	"	55.25MC	2	DC Probe to Point A. Common to chassis.	A30	Adjust fine tuning control and A30 for maximum deflection.
34.	"	"	61.25MC	3	"	A31	Adjust fine tuning control and A31 for maximum deflection.
35.	"	"	67.25MC	4	"	A32	Adjust fine tuning control and A32 for maximum deflection.
36.	"	"	77.25MC	5	"	A33	Adjust fine tuning control and A33 for maximum deflection.
37.	"	"	83.25MC	6	"	A34	Adjust fine tuning control and A34 for maximum deflection.
38.	"	"	213MC	13	"	A35, A36	Adjust fine tuning control and A35 and A36 for maximum deflection.
39.	"	"	207MC	12	"	A37, A38	Adjust fine tuning control A37, and A38 for maximum deflection.
40.	"	"	201MC	11	"	A39, A40	Adjust fine tuning control and mechanically distort A39 and A40 for maximum deflection.
41.	"	"	195MC	10	"	A41, A42	Adjust fine tuning control A41 and A42 for maximum deflection.
42.	"	"	189MC	9	"	A43, A44	Adjust fine tuning control and mechanically distort A43 and A44 for maximum deflection.
43.	"	"	183MC	8	"	A45, A46	Adjust fine tuning control A45 and A46 for maximum deflection.
44.	"	"	177MC	7	"	A47, A48	Adjust fine tuning control and mechanically distort A47 and A48 for maximum deflection.

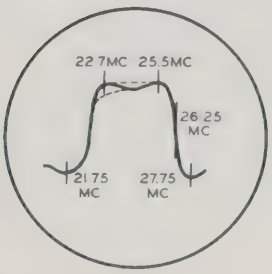


FIG. 1

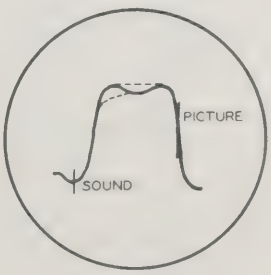


FIG. 2

ALIGNMENT INSTRUCTIONS (CONT.)

RF RESPONSE CHECK

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE & VTVM	ADJUST	REMARKS
45.	One 50Ω carbon res. & two 125Ω carbon res.	Shunt generator with 50Ω resistor and insert 125Ω resistor in each lead. Connect across antenna terminals.	Off	215.75MC	13	VTVM DC Probe to Point (C) Common lead to Point (B)		Adjust fine tuning control for zero reading.
46.	"	"	213MC (10MC Sweep)	215.75MC 211.25MC	13	Vert. Amp. to Point A . Low side to chassis.	A35, A36	If necessary, make slight adjustments to properly place markers as per Fig 2.
47,	"	"	Off	209.75MC	12	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
48.	"	"	207MC (10MC SWP)	209.75MC 205.25MC	12	Vert. Amp. to Point A . Low side to chassis.	A37, A38	If necessary, make slight adjustments to properly place markers as per Fig 2.
49.	"	"	Off	203.75MC	11	VTVM DC Probe to point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
50.	"	"	201MC (10MC SWP)	203.75MC 199.25MC	11	Vert. Amp. to Point A . Low side to chassis.	A39, A40	If necessary, mechanically distort the shape and position of coils A39, and A40 to properly place markers as per Fig 2.
51.	"	"	Off	197.75MC	10	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
52.	"	"	195MC (10MC SWP)	197.75MC 193.25MC	10	Vert. Amp. to Point A . Low side to chassis.	A41, A42	If necessary, make slight adjustments to properly place markers as per Fig 2.
53.	"	"	Off	191.75MC	9	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
54.	"	"	189MC (10MC SWP)	191.75MC 187.25MC	9	Vert. Amp. to Point A . Low side to chassis.	A43, A44	If necessary, mechanically distort the shape and position of coils A43, and A44 to properly place markers as per Fig 2.
55.	"	"	Off	185.75MC	8	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
56.	"	"	183MC (10MC SWP)	185.75MC 181.25MC	8	Vert. Amp. to Point A . Low side to chassis.	A45, A46	If necessary, make slight adjustments to properly place markers as per Fig 2.
57.	"	"	Off	179.75MC	7	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
58.	"	"	177MC (10MC SWP)	179.75MC 175.25MC	7	Vert. Amp. to Point A . Low side to chassis.	A47, A48	If necessary, mechanically distort the shape and position of coils A47 and A48 to properly place markers as per Fig 2.
59.	"	"	Off	87.75MC	6	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
60.	"	"	85MC (10MC SWP)	87.75MC 83.25MC	6	Vert. Amp. to Point A . Low side to chassis.	A29, A34	If necessary, make slight adjustments to properly place markers as per Fig 2.
61.	"	"	Off	81.75MC	5	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
62.	"	"	79MC (10MC SWP)	81.75MC 77.25MC	5	Vert. Amp. to Point A . Low side to chassis.	A28, A33	If necessary, make slight adjustments to properly place markers as per Fig 2.
63.	"	"	Off	71.75MC	4	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
64.	"	"	69MC (10MC SWP)	71.75MC 67.25MC	4	Vert. Amp. to Point A . Low side to chassis.	A27, A32	If necessary, make slight adjustments to properly place markers as per Fig 2.
65.	"	"	Off	65.75MC	3	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
66.	"	"	63MC (10MC SWP)	65.75MC 61.25MC	3	Vert. Amp. to Point A . Low side to chassis.	A26, A31	If necessary, make slight adjustments to properly place markers as per Fig 2.
67.	"	"	Off	59.75MC	2	VTVM DC Probe to Point (C) Common to Point (B)		Adjust fine tuning control for zero reading.
68.	"	"	57MC (10MC SWP)	59.75MC 55.25MC	2	Vert. Amp. to Point A . Low side to chassis.	A25, A30	If necessary, make slight adjustments to properly place markers as per Fig 2.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	-.9VDC	.6VDC	0V.	6.3VAC	200VDC	165VDC	0V§		
V 2	6AG5	-2.4VDC	0V.	0V.	6.3VAC	190VDC	180VDC	0V.		
V 3	6C4	175VDC	0V.	0V.	6.3VAC	175VDC	§-1.9VDC	0V.		
V 4	6BH6	-1.2VDC	.3VDC	0V.	6.3VAC	185VDC	165VDC	0V.		
V 5	6BH6	-2.9VDC	.3VDC	0V.	6.3VAC	185VDC	170VDC	0V.		
V 6	6BH6	0V.	1.1VDC	0V.	6.3VAC	185VDC	155VDC	0V.		
V 7	6BH6	0V.	1.1VDC	0V.	6.3VAC	215VDC	155VDC	0V.		
V 8	6AL5	0V.	-3.8VDC	0V.	6.3VAC	0V.	0V.	-2VDC		
V 9	6BA6	-1VDC	12VDC	0V.	6.3VAC	245VDC	170VDC	12VDC		
V 10	6K6GT	0V.	#6.3VAC	300VDC	360VDC	155VDC	180VDC	#0V.	200VDC	
V 11	12AU7	175VDC	0V.	8.6VDC	0V.	0V.	6.8VDC	0V.	1.2VDC	6.3VAC
V 12	6AU6	#-.1VDC	#.1VDC	#0V.	#6.3VAC	#180VDC	#130VDC	#.9VDC		
V 13	6AU6	#0V.	#.1VDC	#6.3VAC	#0V.	#180VDC	#125VDC	#.8VDC		
V 14	6T8	#-.2VDC	#-.5VDC	#-.2VDC	#6.3VAC	#0V.	#-.1VDC	#0V.	#-.4VDC	#75VDC
V 15	6V6GT	0V.	6.3VAC	290VDC	250VDC	0V.	360VDC	0V.	15VDC	
V 16	6J5GT	0V.	6.3VAC	155VDC 70VDC	15VDC 3VDC	-19VDC	-12VDC	0V.	0V.	
V 17	6SN7GT	0V.	300VDC	4VDC 15VDC	0V.	300VDC	4VDC 15VDC	6.3VAC	0V.	
V 18	6AL5	.2VDC	.2VDC	0V.	6.3VAC	2.7VDC	0V.	-1.5VDC		
V 19	6SN7GT	-2.5VDC	120VDC	11VDC	.3VDC	380VDC	11VDC	0V.	6.3VAC	
V 20	6BG6G	0V.	0V.	6.3VDC	360VDC	-3.5VDC	0V.	6.3VAC	260VDC	TOP CAP 8 *
V 21	6W4GT	0V.	450VDC	450VDC	0V.	360VDC	450VDC	0V.	6.3VAC	
V 22	1B3GT	* DO NOT MEASURE.								
V 23	5U4G	0V.	400VDC	0V.	400VAC	0V.	400VAC	0V.	400VDC	
V 24	12LP4	0V.	1VDC	PIN 10 360VDC	PIN 11 115VDC	PIN 12 6.3VAC				

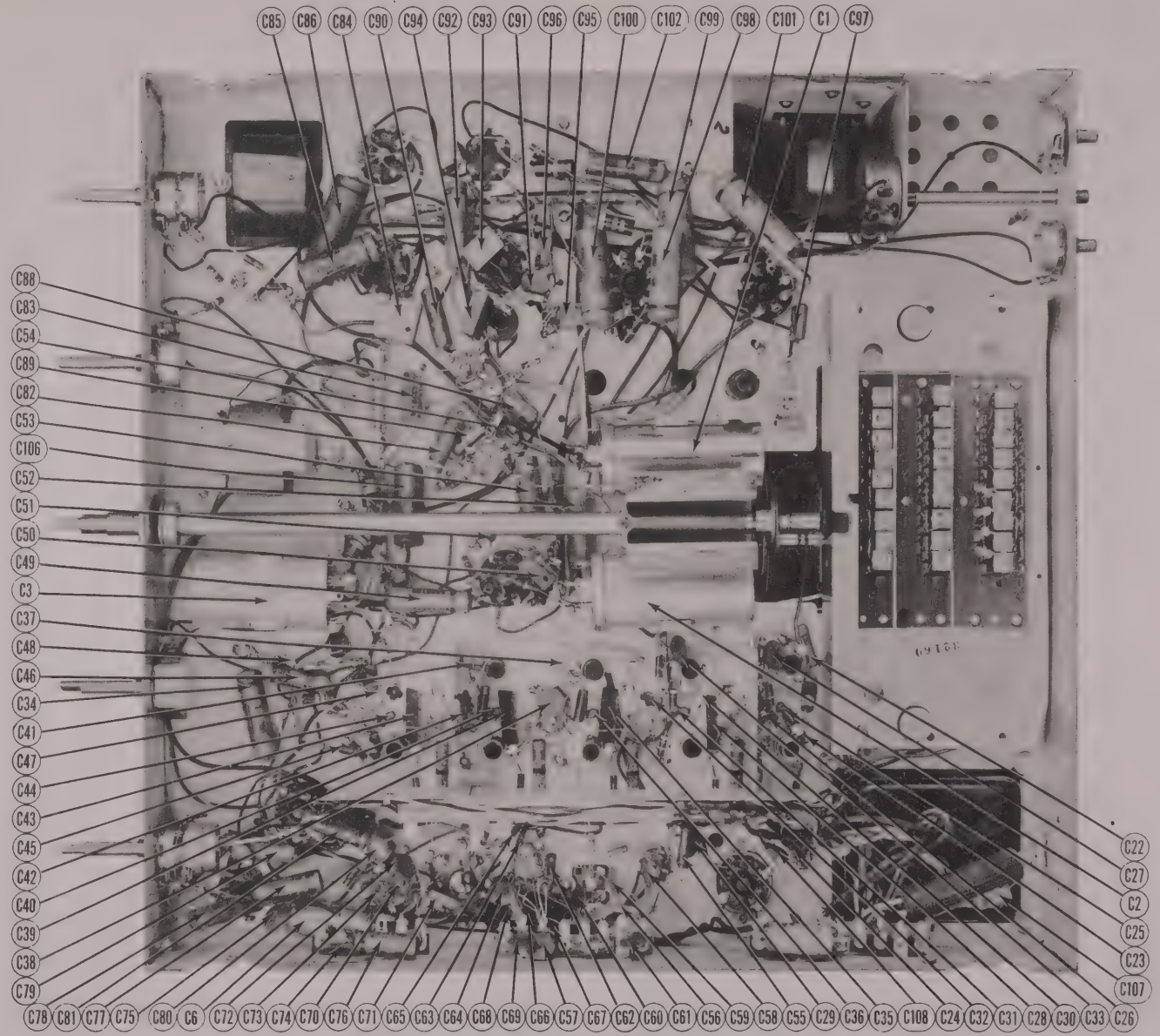
FOCUS CONTROL IN FULLY COUNTERCLOCKWISE POSITION.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
# MEASURED FROM PIN 7 OF V14.

RESISTANCE READINGS

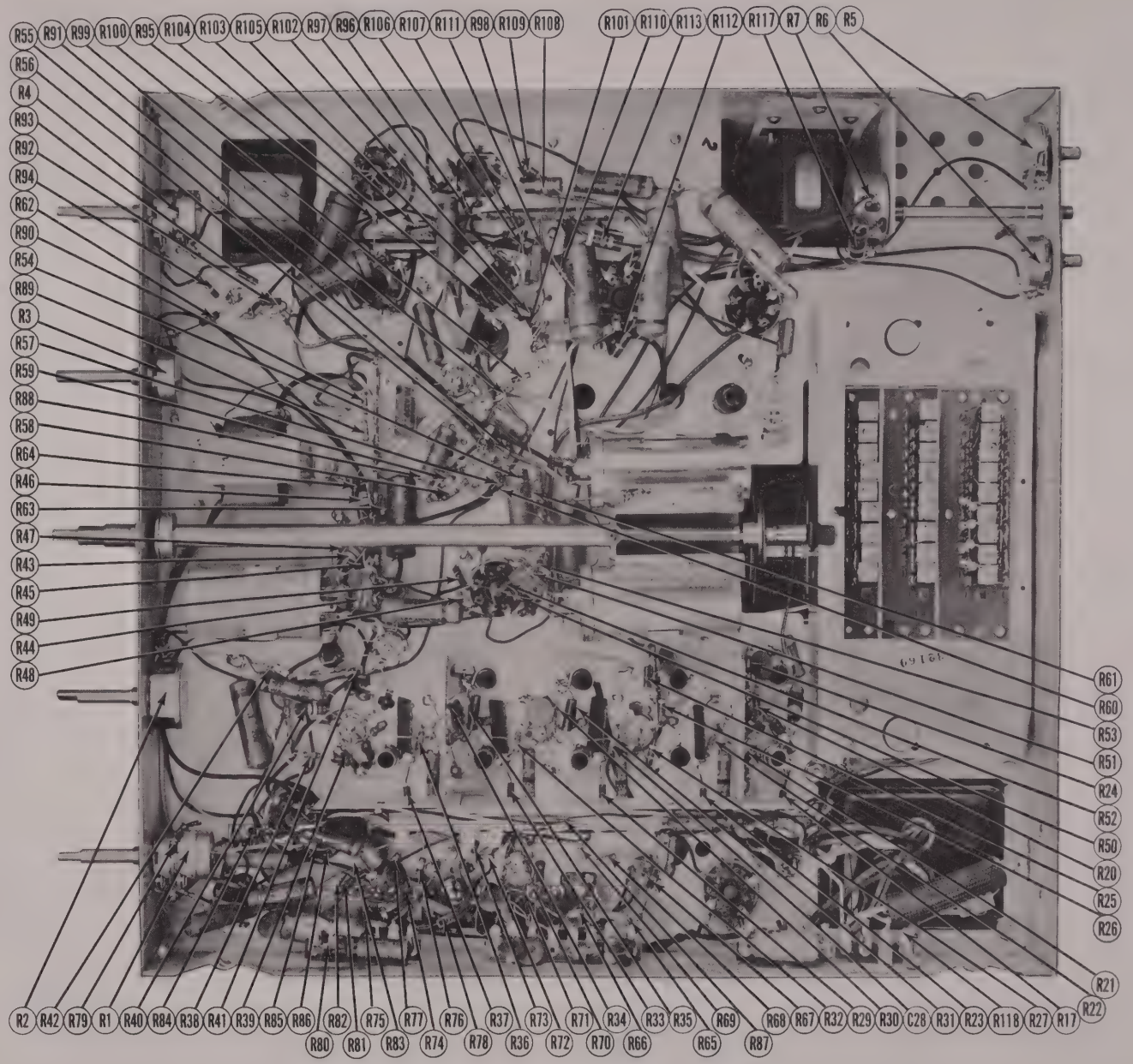
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	1.7 Meg.	100Ω	0Ω	.1Ω	†9.5KΩ	†22KΩ	0Ω		
V 2	6AG5	1 Meg.	0Ω	0Ω	.1Ω	†7.2KΩ	†65KΩ	0Ω		
V 3	6C4	†7.5KΩ	Inf.	0Ω	.1Ω	†7.5KΩ	18KΩ	0Ω		
V 4	6BH6	1.7 Meg.	47Ω	0Ω	.2Ω	†7KΩ	†19KΩ	0Ω		
V 5	6BH6	1.6 Meg.	47Ω	0Ω	.2Ω	†7KΩ	†19KΩ	0Ω		
V 6	6BH6	1.8Ω	100Ω	0Ω	.2Ω	†7KΩ	†19KΩ	0Ω		
V 7	6BH6	1.8Ω	100Ω	0Ω	.2Ω	†7KΩ	†19KΩ	0Ω		
V 8	6AL5	3Ω	680KΩ	0Ω	.1Ω	4Ω	0Ω	3.9KΩ		
V 9	6BA6	3.9KΩ	2KΩ	0Ω	.1Ω	†33KΩ	†25KΩ	2KΩ		
V 10	6K6GT	Inf.	#.1Ω	†5KΩ	†225Ω	#480KΩ	#10KΩ	#0Ω	†7.5KΩ	
V 11	12AU7	†15KΩ	1 Meg.	3.9KΩ	0Ω	0Ω	47KΩ	0Ω	1 Meg.	.1Ω
V 12	6AU6	#400KΩ	#7Ω	#0Ω	#.1Ω	†1.1KΩ	†19KΩ	#89Ω		
V 13	6AU6	#100KΩ	#3Ω	#.1Ω	#0Ω	†1.1KΩ	†19KΩ	#71Ω		
V 14	6T8	Inf.	#20KΩ	Inf.	#.1Ω	#0Ω	#200KΩ	#0Ω	#10 Meg.	†270KΩ
V 15	6V6GT	Inf.	.1Ω	†2KΩ	†56KΩ	470KΩ	†225Ω	0Ω	390Ω	
V 16	6J5GT	0Ω	.1Ω	▲1.1 Meg. ▲2.5 Meg.	4KΩ 6KΩ	2 Meg.	1 Meg.	0Ω	0Ω	
V 17	6SN7GT	2.2 Meg.	†8KΩ	2.2KΩ 270Ω	2.2 Meg.	†8KΩ	2.2KΩ 270Ω	.1Ω	0Ω	
V 18	6AL5	27KΩ	27KΩ	0Ω	.1Ω	4.8 Meg.	0Ω	4.8 Meg.		
V 19	6SN7GT	150KΩ	▲295KΩ	1.5KΩ	5 Meg.	▲28KΩ	1.5KΩ	0Ω	.1Ω	
V 20	6BG6G	Inf.	0Ω	82Ω	†230Ω	1 Meg.	Inf.	.1Ω	†9.1KΩ	TOP CAP ▲250Ω
V 21	6W4GT	Inf.	▲40Ω	▲0Ω	Inf.	†225Ω	▲3Ω	0Ω	.1Ω	
V 22	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲950Ω
V 23	5U4G	Inf.	35KΩ	Inf.	50Ω	Inf.	50Ω	Inf.	35KΩ	
V 24	12LP4	0Ω	1.1 Meg.	PIN 10 †1.2KΩ	PIN 11 80KΩ	PIN 12 .1Ω				

FOCUS CONTROL IN FULLY COUNTERCLOCKWISE POSITION.
† MEASURED FROM PIN 8 OF V23.
▲ MEASURED FROM PIN 3 OF V21.
MEASURED FROM PIN 7 OF V14.

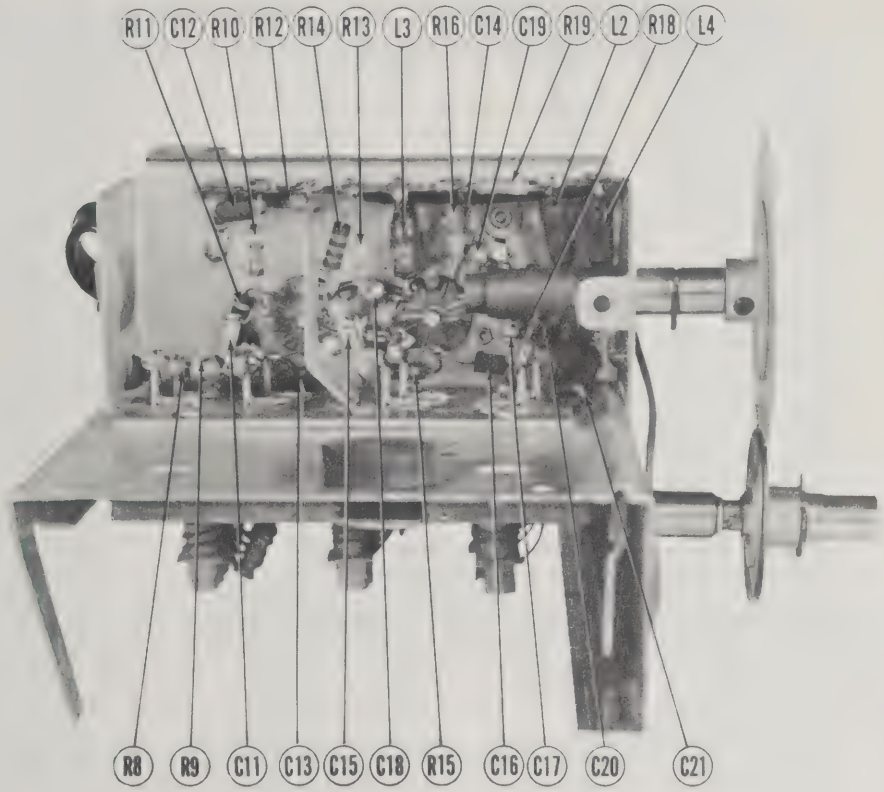
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



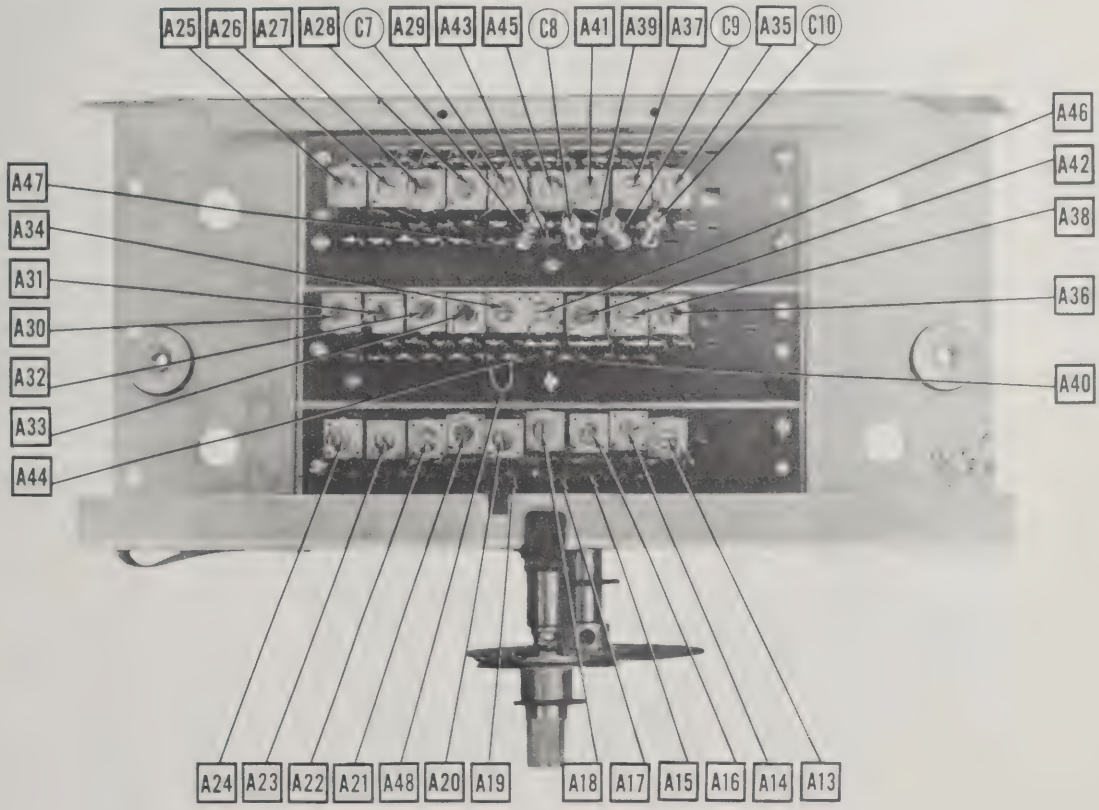
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RF TUNER – SIDE VIEW



RF TUNER – BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BH6	6BH6	7CM	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6C4	6C4	6BG	
V4	1st Video IF	6BH6	6BH6	7CM	
V5	2nd Video IF	6BH6	6BH6	7CM	
V6	3rd Video IF	6BH6	6BH6	7CM	
V7	4th Video IF	6BH6	6BH6	7CM	
V8	Video Det.-AGC	6AL5	6AL5	6BT	
V9	Video Amp.	6BA6	6BA6	7BK	
V10	Video Output	6K6GT	6K6GT	7S	
V11	DC Rest.-Sync. Clipper-Sync. Amp.	12AU7	12AU7	9A	
V12	1st Sound IF	6AU6	6AU6	7BK	
V13	2nd Sound IF	6AU6	6AU6	7BK	
V14	Ratio Det.-AF Amp.	6T8	6T8	9E	
V15	Audio Output	6V6GT	6V6GT	7AC	
V16	Vert. Osc.	6J5GT	6J5GT	8Q	
V17	Vert. Amp.	6SN7GT	6SN7GT	8BD	
V18	Hor. AFC	6AL5	6AL5	6BT	
V19	Hor. Mult.	6SN7GT	6SN7GT	8BD	
V20	Hor. Output	6BG6G	6BG6G	5BT	
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rect.	1B3GT	1B3GT	3C	
V23	LV Rect.	5U4G	5U4G	5T	
V24A	Picture Tube	12LP4	12LP4	12D	
B	Picture Tube	10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475	PA4307-13	AF8X		UP450		TVL-20	▲ Filter
B	40	475							▲ Filter
C2A	40	475	PA4307-14	AF8X81		UP9BJ995		TVL-20	▲ Filter
B	40	400							▲ Decoupling
C3A	40	475	PA4307-12	AF82X2H2F				TVL-40	▲ Filter
B	10	475							■ Low Pass Filter
C	10	400							▲ Bias Filter
D	10	250							1st V. Amp. Screen Byp.
C4A	10	475	PA4307-9	AF22X4I20A				TVL-39	▲ Vert. Osc. Decoup.
B	10	475						TVA-8	■ Vert. Output Decoup.
C	20	400							▲ Decoupling
D	100	25							Vert. Output Cath. Byp.
C5A	10	475	PA4307-10	AF2X8234B				TVL-68	▲ Output Plate Decoup.
B	40	450							■ Decoupling
C	10	450							▲ Output Screen Byp.
D	20	50							Output Cath. Byp.
C6	5	50	PA4308-2	PRS150/4		BR550		TVA-13	Stabilizing Cap.
C7	15			CN15JNPO	D2-15		NPOK-15		Fixed Trimmer
C8	15			CN15JNPO	D2-15		NPOK-15		Fixed Trimmer
C9	15			CN15JNPO	D2-15		NPOK-15		Fixed Trimmer
C10	15			CN15JNPO	D2-15		NPOK-15		Fixed Trimmer
C11	47			CN47KN750	DN-47		N750L-47		RF Coupling
C12	470			GP470M	D6-471		GP2K-470		AGC Filter
C13	470			GP470M	D6-471		GP2K-470		RF Screen Byp.
C14	470			GP470M	D6-471		GP2K-470		RF Bypass
C14	47			CN47KN750	DN-47		N750L-47		RF Coupling
C16	1.5			CNL.5CNPO	D2-1.5		NPOK-1.5		Osc. Coupling
C17	470			GP470M	D6-471		GP2K-470		Mixer Screen Bypass
C18	470			GP470M	D6-471		GP2K-470		Mixer Fil. Bypass
C19	10			CN10FN330			N330K-10		Fixed Trimmer
C20	10			CN10FN750	DN-10		N750K-10		Osc. Feedback
C21	470			GP470M	D6-471		GP2K-470		Osc. Fil. Bypass
C22	100		PA4332-1	SI100KNPO	D2-100		NPOM-100		Fixed Trimmer
C23	1000		HK36H-102	GP1000M	D6-102		GP2L-001	1FM-21	Mixer Plate Dec.
C24	5000		PA4334-1	BPD-5	D6-502		811-005	29C1	RF Bypass
C25	270		HK36M-271	GP270M	D6-271		GP2K-270	1FM-325	IF Coupling
C26	1000		HK36H-102	GP1000M	D6-101	1W5D1	GP2L-001	1FM-21	AGC Filter
C27	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C28A	1000		PA4339-2	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	1st V. IF Decoup.
B	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	1st V. IF Screen Byp.
C	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	1st V. IF Fil. Byp.
C29	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C30	100		CC30A-101F	CN100JNPO	D2-100	5R5T1	NPOM-100	MS-31	Fixed Trimmer
C31	270		HK36M-271	GP270M	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C32	1000		HK36H-102	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	AGC Filter
C33	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	AGC Filter
C34	.1	200		P288-1		PTE4P1		TM-1	AGC Filter
C35A	1000		PA4339-2	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	2nd V. IF Decoup.
B	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	2nd V. IF Screen Byp.
C	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	2nd V. IF Fil. Byp.
C36	270		HK36M-271	GP270M	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C37	470	500	MC80E-471	1469-0005		5R5T5		MS-35	Fixed Trimmer
C38	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	3rd V. IF Cath. Byp.
C39A	1000		PA4339-2	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	3rd V. IF Decoup.
B	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	3rd V. IF Screen Byp.
C	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	3rd V. IF Fil. Bypass
C40	270		HK36H-271	GP270M	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C41	470	500	MC80E-471	1469-0005		5R5T5		MS-35	Fixed Trimmer
C42	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	4th V. IF Cath. Byp.
C43A	1000		PA4339-2	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	4th V. IF Decoup.
B	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	4th V. IF Screen Byp.
C	1000			GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	4th V. IF Fil. Byp.
C44	270		HK36M-271	GP270M	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C45	120		HK36K-121	GP120M	D6-121	5W5T15	GP2K-120	1FM-315	IF Coupling
C46	.01	200		P488-01	D6-103	PTE4S1	811-01	TM-11	DAGC Decoupling
C47	10		CC30A-100F	CN10DNPO	D2-10	5W5Q1	NPOK-10	MS-41	V. Diode Filter
C48	18		CC30A-180F	CN18JNPO	D2-18	5R5Q2	NPOK-20	MS-42	Fixed Trimmer
C49	.05	400		P488-05		PTE4S5		TM-15	Video Coupling
C50	750	500		1468-00075	D6-751	1W5T8	GP2K-750	1FM-37	Video Output Cath. Byp.

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	V. Output Fil. Byp.
C52	.05	400		P488-05		PTE4S5		TM-15	Video Coupling
C53	.05	400		P488-05		PTE4S5		TM-15	Video Coupling
C54	22		CC30A-220K	CN22KNPO	D2-22	5W5Q25	GP1K-22	MS-425	Sync. Clipper Plate Byp.
C55	100		CC32A-101A	GP1000M	D6-101	5W5T1	GP1K-100	1FM-31	S. IF Coupling
C56	1000		HK36H-102	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	AVC Filter
C57	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	1st S. IF Decoup.
C58	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	1st S. IF Screen Byp.
C59	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	1st S. IF Decoup.
C60	100		CC32A-101A	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	S. IF Coupling
C61	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	2nd S. IF Decoup.
C62	1000		HK36H-102	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	2nd S. IF Cath. Byp.
C63	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	2nd S. IF Screen Byp.
C64	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	2nd S. IF Screen Byp.
C65	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	2nd S. IF Decoupling
C66	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	Filament Bypass
C67	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	Filament Bypass
C68	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	Filament Bypass
C69	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	Filament Bypass
C70	3.3		PA4326-4	C13.3CNPO	D2-3.3		NPOK-3.3		Balancing
C71	270	500		1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Diode Load Cap.
C72	2000		PA4334-3	GP2000M	D6-202	1W5D2	811-002	1FM-22	De-emphasis
C73	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C74	1000		HK36H-102	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	AVC Filter
C75	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	RF Bypass
C76	.02	400		P488-02		PTE4S2		TM-12	Audio Coupling
C77	.02	400		P488-02		PTE4S2		TM-12	Audio Coupling
C78	.03	200		P488-03		PTE6S3		TM-13	Tone Compensation
C79	.005	200		P688-005	D6-502	PTE5D5	811-005	TM-25	Tone Compensation
C80	.02	600		P688-02		PTE8S2		TM-12	Audio Coupling
C81	.005	600		P688-005	D6-502	PTE8D5	811-005	TM-25	Output Plate Bypass
C82	.01	400		P488-01	D6-103	PTE4S1	811-01	TM-11	Sync. Coupling
C83A	2000		PA4307-14	GP2000M	D6-202	PTE6D2	GP2M-002	1FM-22	Integrator Net.
B	5000			GP5000M	D6-502	PTE6D5	811-005	1FM-25	Integrator Net.
C	5000			GP5000M	D6-502	PTE6D5	811-005	1FM-25	Integrator Net.
C84	4700	500	MC61F-472	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C85	.1	400		P488-1		PTE4P1		TM-1	Vert. Discharge
C86	.25	400		P488-25		GT4P25		TC-2	Vert. Sweep Coupling
C87	.1	200		P288-1		PTE4P1		TM-1	Fixed Trimmer
C88	1000	500	MC61E-102	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coup.
C89	1000	500	MC61E-102	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coup.
C90	.01	400		P488-01	D6-103	PTE4S1	811-01	TM-11	Integrator Net.
C91	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	AFC Filter
C92	.05	200		P288-05		PTE4S5		TM-15	AFC Filter
C93	220	500	MC60E-331	1468-00025	D6-221	5W5T25	GP2K-220	1FM-325	Hor. MV Feedback
C94	4000	500	MC63F-392	1464-004		1D5D4		MS-34	Fixed Trimmer
C95	390	500	MC60E-391	1469-0004	D6-391	5R5T4	GP2K-390	MS-34	Hor. Discharge
C96	270	500	MC60E-271	1468-00015	D6-271	5W5T25	GP2K-270	1FM-325	Hor. Sweep Coup.
C97	10	1500	PA4340-5						Hor. Feedback
C98	.05	600		P688-05		PTE8S5		TM-15	Hor. Output Screen Byp.
C99	.25	200		P488-25		GT2P25		TC-2	Hor. Output Cath. Byp.
C100	.25	200		P488-25		GT2P25		TC-2	Hor. Sweep Coupling
C101	.1	600		P688-1		PTE6P1		TM-1	Damper Filter
C102	.02	600		P688-02		PTE8S2		TM-12	Damper Filter
C103	470	500		1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	Fixed Trimmer
C104	470	500		1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	Fixed Trimmer
C105	500	10000	PA4343	HV-500	TV1-500				HV Filter
C106	.1	400		P488-1		PTE4P1		TM-1	Pic. Tube Cath. Byp.
C107	30	500	MC60G-300	1468-0004	D6-330	5W5Q3	GP1K-30	MS-43	Ant. Coupling
C108	5000		PA4334-1	BPD-5	D6-502	1D5D5	811-005	29C1	Filament Bypass

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	PA4428-1	B11-137 *		SBBT-629-S	Tone control-front
B	330KΩ	½		B18-132X *		Not Req.	Volume control-rear-tapped at 50KΩ
C	Shaft End			E-187 *		Not Req.	Attach per instr. in "Concentrikit".
D	Switch			76-1 *		Not Req.	Attach per instr. in "Concentrikit".
R2	5000Ω	2	PA4427	W-5000	43-5000	V-135	Contrast control-Wire Wound
R3	100KΩ	½	PA4432	Q11-128	M-49-S	B-40	Brightness control
R4A	50KΩ	½		B11-123 *		SBB-630	Horiz. hold control-front
B	1 Meg.	½	PA-4430-1	B11-137 *		Not Req.	Vert. hold control-rear
C	Shaft End			E-187 *		Not Req.	Attach per instr. in "Concentrikit".
R5A	2000Ω	½	PA4433	Q11-110	M-11-S	AN-6	Vert. linearity control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R5A per instructions
R6A	2.5 Meg.	½	PA4431	Q11-239	M-84-S	AN-83	Vert. size control
B	Shaft		Not Req.	Not Req.	Not Req.	AK-1	Attach to R6A per instructions
R7	1500Ω	4	PA4426				Focus control-Wire Wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	100KΩ 20%	½		BTS-100K	Ant. Loading
R9	100KΩ 20%	½		BTS-100K	Ant. Loading
R10	47KΩ	½		BTS-47K	RF Grid
R11	100Ω	½			RF Cathode
R12	1000Ω	½		BTS-1000	AGC Network
R13	15KΩ	½		BTS-15K	RF Screen
R14	2200Ω 20%	½		BTS-2200	RF Plate
R15	1 Meg.	½		BTS-1 Meg.	Mixer Grid
R16	56KΩ	½		BTS-56K	Mixer Screen
R17	100Ω 20%	½			Mixer Plate Decoupling
R18	18KΩ	½		BTS-18K	Osc. Grid
R19	470Ω	½		BTS-470	Osc. Plate
R20	15KΩ 5%	½			1st Video IF Grid
R21	47Ω	½			1st Video IF Cathode
R22	12KΩ	½		BTS-12K	1st Video IF Screen
R23	100Ω 20%	½			1st Video IF Decoupling
R24	1000Ω 20%	½		BTS-1000	AGC Network
R25	1000Ω 20%	½		BTS-1000	AGC Network
R26	4700Ω 5%	½			2nd Video IF Grid
R27	47Ω	½			2nd Video IF Cathode
R28	12KΩ	½		BTS-12K	2nd Video IF Screen

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES
R29	100Ω 20%	½			2nd Video IF Decoupling
R30	15KΩ 5%	½			3rd Video IF Grid
R31	100Ω	½			3rd Video IF Cathode
R32	12KΩ	½		BTS-12K	3rd Video IF Screen
R33	100Ω	½			3rd Video IF Decoupling
R34	2200Ω 5%	½		BTS-2200-5%	4th Video IF Grid
R35	100Ω	½			4th Video IF Cathode
R36	12KΩ	½		BTS-12K	4th Video IF Screen
R37	100Ω 20%	½			4th Video IF Decoupling
R38	1 Meg. 20%	½		BTS-1 Meg.	AGC Network
R39	680KΩ 5%	½		BTS-680K-5%	AGC Rect. Diode Load
R40	270KΩ	1		BTA-270K	Voltage Divider
R41	3900Ω	½		BTS-3900	Video Det. Diode Load
R42	4700Ω	½		BTS-4700	Voltage Divider
R43	33KΩ	½		BT-2-33K	Video Amp. Screen
R44	3300Ω	½		BTS-3300	Video Amp. Plate
R45	15KΩ	2		BT-2-15K	Low Pass Filter
R46	15KΩ	2		BT-2-15K	Low Pass Filter
R47	39KΩ	1		BTA-39K	Voltage Divider
R48	470KΩ	½		BTS-470K	Video Output Grid
R49	220KΩ 5%	½		BTS-220K-5%	Bias Network
R50	10KΩ 5%	½		BTS-10K-5%	Bias Network
R51	330Ω	½			Video Output Cathode
R52	4700Ω	2		BT-2-4700	Video Output Plate
R53	10KΩ	½		BTS-10K	Isolation
R54	100KΩ	½		BTS-100K	Picture Tube Grid
R55	1 Meg.	½		BTS-1 Meg.	DC Rest. Load
R56	47KΩ	½		BTS-47K	Voltage Divider
R57	1 Meg.	½		BTS-1 Meg.	Sync. Clipper Plate
R58	1 Meg.	½		BTS-1 Meg.	Sync. Amp. Grid
R59	3900Ω	½		BTS-3900	Sync. Amp. Cathode
R60	3900Ω	½		BTS-3900	Sync. Amp. Plate
R61	3900Ω	½		BTS-3900	Sync. Amp. Plate
R62	10KΩ	½		BTS-10K	Voltage Divider
R63	220KΩ	½		BTS-220K	Voltage Divider
R64	1000Ω 5%	½		BTS-1000-5%	Acc. Anode Decoupling
R65	100KΩ 20%	½		BTS-100K	1st Sound IF Grid
R66	100KΩ 20%	½		BTS-100K	AVC Network
R67	82Ω	½			1st Sound IF Cathode
R68	18KΩ	½		BTS-18K	1st Sound IF Screen
R69	1000Ω	½		BTS-1000	1st Sound IF Decoupling
R70	100KΩ 20%	½		BTS-100K	2nd Sound IF Grid
R71	68Ω	½			2nd Sound IF Cathode
R72	18KΩ	½		BTS-18K	2nd Sound IF Screen
R73	1000Ω	½		BTS-1000	2nd Sound IF Decoupling
R74	470Ω	½		BTS-470	Balancing
R75	220KΩ 20%	½		BTS-220K	AVC Network
R76	10KΩ	½		BTS-10K	Ratio Det. Diode Load
R77	10KΩ	½		BTS-10K	Ratio Det. Diode Load
R78	27KΩ	½		BTS-27K	De-emphasis
R79	10KΩ	½		BTS-10K	Tone Compensation
R80	1.8 Meg.	½		BTS-1.8 Meg.	AVC Network
R81	10 Meg. 20%	½		BTS-10 Meg.	AF Amp. Grid
R82	270KΩ	½		BTS-270K	AF Amp. Plate
R83	470KΩ	½		BTS-470K	Output Grid
R84	390Ω	1		BTA-390	Output Cathode
R85	3.3 Meg. 20%	½		BTS-3.3 Meg.	HV Filter Feedback
R86	56KΩ	1		BTA-56K	Output Screen
R87A	7000Ω	10	PA4211		Filter-Wire Wound
B	1500Ω	5			Output Plate Decoupling-Wire Wound
R88	22KΩ	½		BTS-22K	Integrator Network
R89	8200Ω	½		BTS-8200	Integrator Network
R90	8200Ω	½		BTS-8200	Integrator Network
R91	1 Meg.	½		BTS-1 Meg.	Vert. Osc. Grid
R92	1.5 Meg. 20%	½		BTS-1.5 Meg.	Vert. Osc. Plate
R93	6.8 Meg.	½		BTS-6.8 Meg.	Voltage Divider
R94	100KΩ	½		BTS-100K	Voltage Divider
R95	3900Ω	½		BTS-3900	Vert. Peaking
R96	270Ω	½		BW-1-270	Vert. Amp. Cathode
R97	2.2 Meg.	½		BTS-2.2 Meg.	Vert. Amp. Grid
R98	6800Ω	2		BT-2-6800	Vert. Amp. Decoupling
R99	100KΩ	½		BTS-100K	Horiz. AFC Disc. Load
R100	100KΩ	½		BTS-100K	Horiz. AFC Disc. Load
R101	4.7 Meg. 20%	½		BTS-4.7 Meg.	Horiz. AFC Disc. Load
R102	470KΩ	½		BTS-470K	Horiz. AFC Filter Network
R103	27KΩ	½		BTS-27K	Feedback
R104	5600Ω 5%	½		BTS-5600-5%	Horiz. MV Plate
R105	1500Ω 5%	½		BTS-1500-5%	Horiz. MV Cathode
R106	100KΩ 5%	½		BTS-100K-5%	Horiz. MV Grid
R107	270KΩ 5%	½		BTS-270K-5%	Horiz. MV Plate
R108	22KΩ	2		BT-2-22K	Filter
R109	56KΩ	½		BTS-56K	Decoupling
R110	68Ω	½			Parasitic Supp.
R111	1 Meg.	½		BTS-1 Meg.	Horiz. Output Grid
R112	82Ω	1		BW-1-82	Horiz. Output Cathode
R113	9100Ω 5%	2			Horiz. Output Screen
R114	10KΩ	10	PA4200-11	AB-10,000	Damper Filter-Wire Wound-See Note
R115	3Ω	½			HV Rect. Filament-Wire Wound
R116	1 Meg. 20%	1			HV Filter
R117	820Ω	2		BT-2-820	Focus Coil Shunt
R118	680Ω 20%	½		BTS-680	Ant. Isolation

Note. Models using 10" picture tube use 8500Ω, 10 watt resistor in this application, Part No. PA4200-12.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.9A	720VCT .240ADC	5VAC @ 3A	6.3VAC @ 1.5A SEC. 4 6.3VAC @ 7A	AB44015-1			TP-360

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	172Ω	900Ω	AB47006-2	A-8111	A-3000	TBO-1	Vert. Block Osc. Trans
T3	900Ω Tap ⓐ 190Ω	20Ω Tap ⓐ .6Ω SEC. 2 0Ω	PB40216	A-8128	HVO-3	TFB-3	Hor. Output Trans.
T4	690Ω	6.5Ω	AB44062-3	A-8115	A-3035	TSO-1	Vert. Output Trans.
T5A	.4Ω		PC70004				Hor. Deflection Coil
B	62Ω						Vert. Deflection Coil
T6	215Ω		PC70001-2	FC-10	MF-1		Focus Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	6700Ω	4Ω	258Ω	.4Ω	AB44066-1	A-3878 ③	A-2931 ③	RO-13 ③	③ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA SPARTON PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A B	PM	4Ω	PC63000-22④ PC63000-20 or PC63000-24 ⑤	46J6	46A07	④ Used in table models. ⑤ Used in console models.
	CONE DIA.	V. C. DIA.				
SP2A B	6 x 4	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.240ADC	70Ω	4.7 Henry	AB47007-1	C-1703 ①	C-3196 ①	TR-3300①	① Drill new mounting holes.

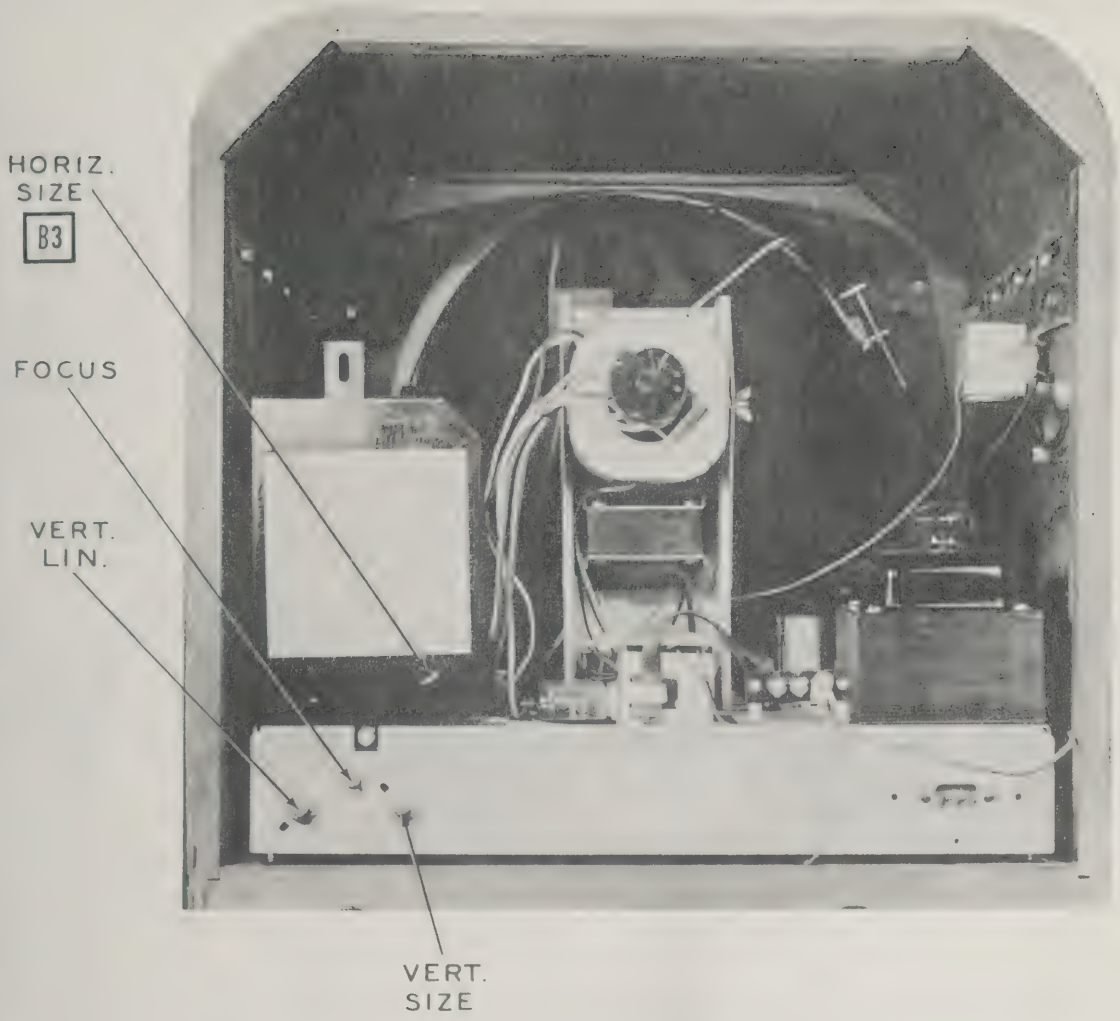
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	MEISSNER PART No.	NOTES
L2	RF Choke	.2Ω		AA6644-2		
L3	Fil. Choke	.1Ω		AA6644-2		
L4	Fil. Choke	.1Ω		AA6644-2		
L5	RF Choke	3Ω		PA4225-3		
L6	Adj. Channel Sound Trap	.1Ω		AB43524-5		
L7	RF Trap	.2Ω		AA6654-1		
L8	1st Video IF	.1Ω		AB43523-4		
L9	Fil. Choke	.2Ω		PA4225-2		
L10	Adj. Channel Sound Trap	.1Ω		AB43524-1		
L11	2nd Video IF	.1Ω		AB43523-1		
L12	Fil. Choke	.2Ω		PA4225-2		
L13	3rd Video IF	.1Ω		AB43523-2		
L14	Fil. Choke	.2Ω		PA4225-2		
L15	3rd Video IF Grid Choke	1.9Ω		AA6644-1		
L16	Sound IF Trap	0Ω	0Ω	AB43524-1		
L17	4th Video IF	.1Ω		AB43523-2		
L18	Fil. Choke	.2Ω		PA4225-2		
L19	4th Video IF Grid Choke	1.9Ω		AA6644-1		
L20	Sound IF Trap	0Ω		AB43524-2		
L21	5th Video IF	.1Ω		AB43523-3		
L22	Peaking	3Ω		AA6650-1		25 microhenries
L23	Peaking	9.5Ω		AA6402-1	19-1921 †	180 microhenries, wound on 39KΩ resistor
L24	Peaking	11Ω		AA6613-9	19-1922	250 microhenries
L25	Peaking	6Ω		AA6613-6	19-1920	83 microhenries
L26	Peaking	7.4Ω		AA6402-2	19-1921 *	120 microhenries, wound on 22KΩ resistor
L27	Peaking	6.8Ω		AA6613-3	19-1920	95 microhenries
L28	Peaking	9.5Ω		AA6402-3	19-1921 *	180 microhenries, wound on 22KΩ resistor
L29	Peaking	11Ω		AA6650-7	19-1922	235 microhenries
L30	RF Choke	3.4Ω		PA4225-3		
L31	RF Choke	3.4Ω		PA4225-3		
L32	Sound IF	3Ω		AA6663-2		
L33	RF Choke	3.4Ω		PA4225-3		Not used in all models.
L34	RF Choke	3.4Ω		PA4225-3		Not used in all models.
L35	Ratio Det. Trans.	.5Ω	.1Ω	AA6684-3		
L36	Horiz. Freq.	65Ω		AA6401-1		
L37	Horiz. Lin.	39Ω		AA6400-1		
L38	Horiz. Size	68Ω	.3Ω	AA6400-2		
L39	Fil. Choke	.1Ω		AA6651-1		
L40	Fil. Choke	.1Ω		AA6651-1		
L41	Fil. Choke	.1Ω	.1Ω	AA6664-2		
L42	AC Line Choke	.1Ω	.1Ω	AA6664-1		

† Parallel with 39KΩ resistor.
* Parallel with 22KΩ resistor.

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M1	RF Tuner	AD93152-1	Complete with tubes
M2	Fuse	PA4212-1	.25A 250V Type 3AG-312
M3	Ion Trap	PA1175	
	Trimmer	PA4368	Horiz. drive 25-300MMF
	Knob	PA5634-1	Single control
	Knob	PA5633-1	Dual control inner
	Knob	PA5632-1	Dual control outer
	Knob	PA5631-1	Channel selector
	Knob	PA5630-1	Fine tuning



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer clockwise as far as possible without crowding the right half of the picture.

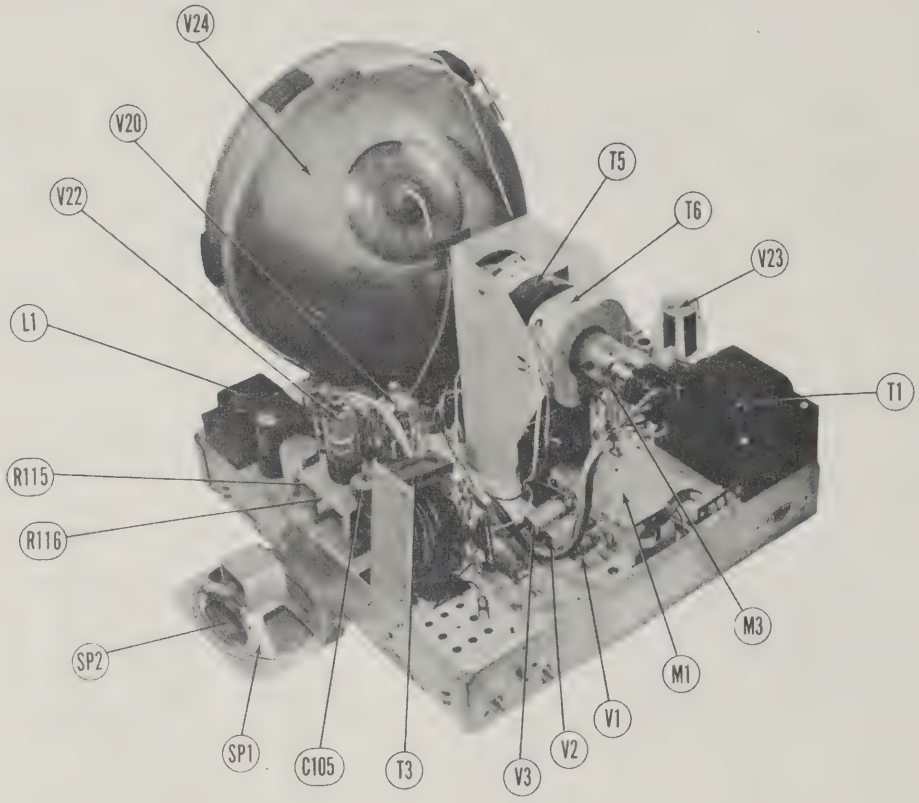
Adjust the horizontal width slug (B3) until the picture is of proper width horizontally.

Adjust the horizontal linearity slug until the picture is symmetrical from left to right.

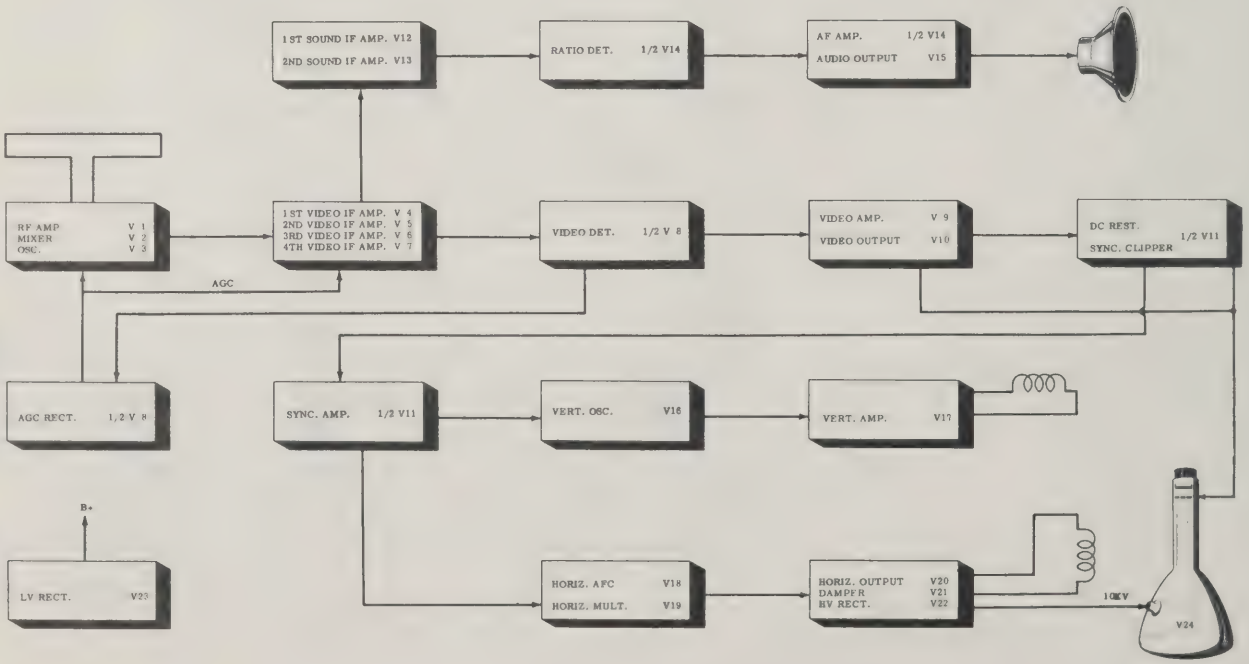
Readjustment of B2 may be necessary for optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs from front of set.
2. Remove four screws and one 1/4" hex head screw holding rear cover. Remove cover.
3. Unsolder both speaker leads at speaker connection.
4. Unsolder antenna ground lead at antenna terminal strip.
5. Remove five 3/8" hex head bolts holding chassis at bottom. Remove chassis.
6. Remove two 11/32" hex nuts holding speaker. Remove speaker.

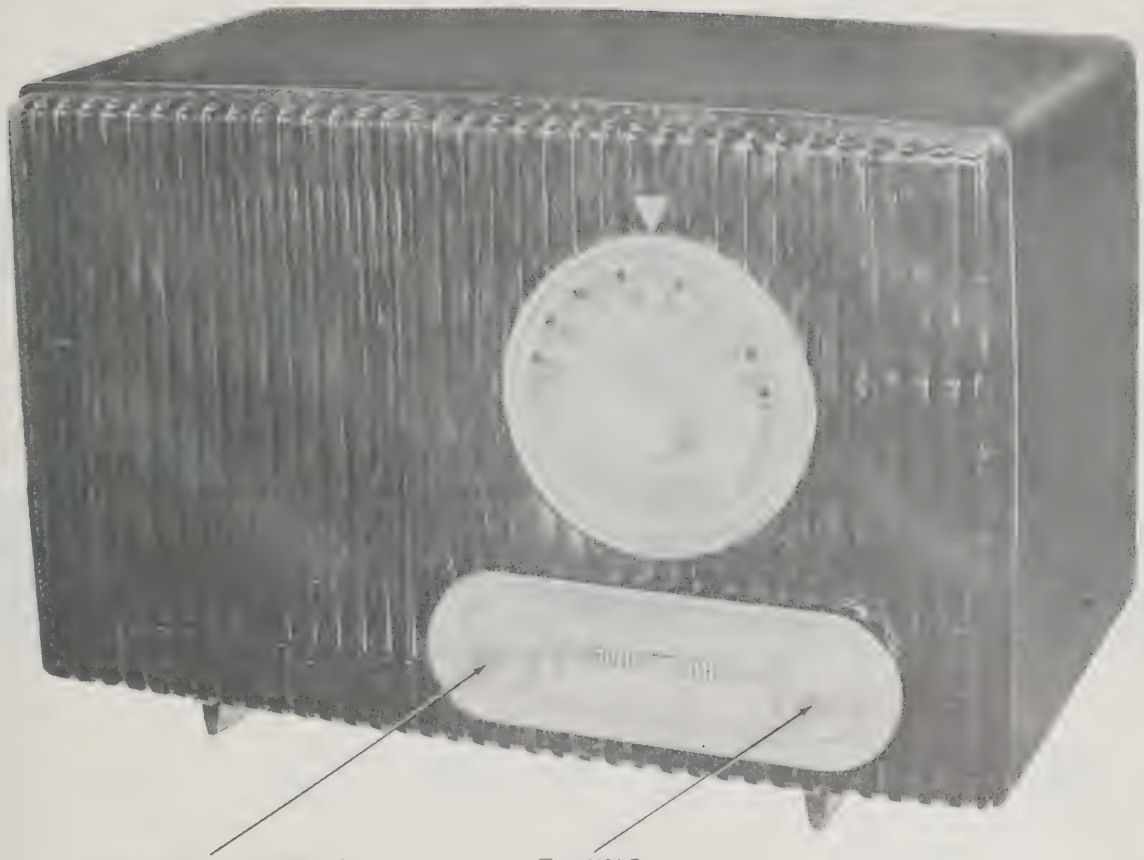


CHASSIS-TOP VIEW



BLOCK DIAGRAM

STEWART-WARNER
MODELS 9152-A, 9152-B, 9152-C



STEWART-WARNER
MODELS 9152-A, 9152-B, 9152-C

STEWART-WARNER MODEL 9152-A

TRADE NAME	Stewart-Warner, Models 9152-A, 9152-B, 9152-C
MANUFACTURER	Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50B5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .26 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (Grid) of 12BE6 (V1). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1400KC	1400KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

STEWART-WARNER
MODEL 9152-A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEW.-WARN. PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	DET-AVC-AF	12AT6	12AT6	7BT	
V4	Power Output	50B5	50B5	7BZ	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: STEW.-WARN. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	150	508147	PRSA150/30-		EDL3215		TA-230	Filter-Red
B	20	150		30					Filter-Blue
C2	.05	400	512028	P488-05		PTE4S5		TM-15	AVC Filter
C3	.15	400	512040	P488-15		GT4P2		72P53	Line Isolation
C4	100	500	512503	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Osc. Grid Cap.
C5	100	500	512503	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C6	.01	400	512010	P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C7A	250		*	GP250M	D6-251	5W5T25	GP2K-250	1FM-325	AF Amp. Plate
B	5000			BPD-5	D6-502	PTE6D5	811-005	TM-25	Audio Coupling
C8	.005	600	512006	P688-005	D6-502	PTE6D5	811-005	TM-25	Output Plate
C9	.05	600	512030	P688-05		PTE6S5		TM-15	Line Filter

* Items C7A, C7B, R6A and R6B are combined into one unit obtainable under MFGR'S Part No. 505858.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: Stew.-Warn. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	506087	Q13-137	AG-63-Z	BSK-70-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

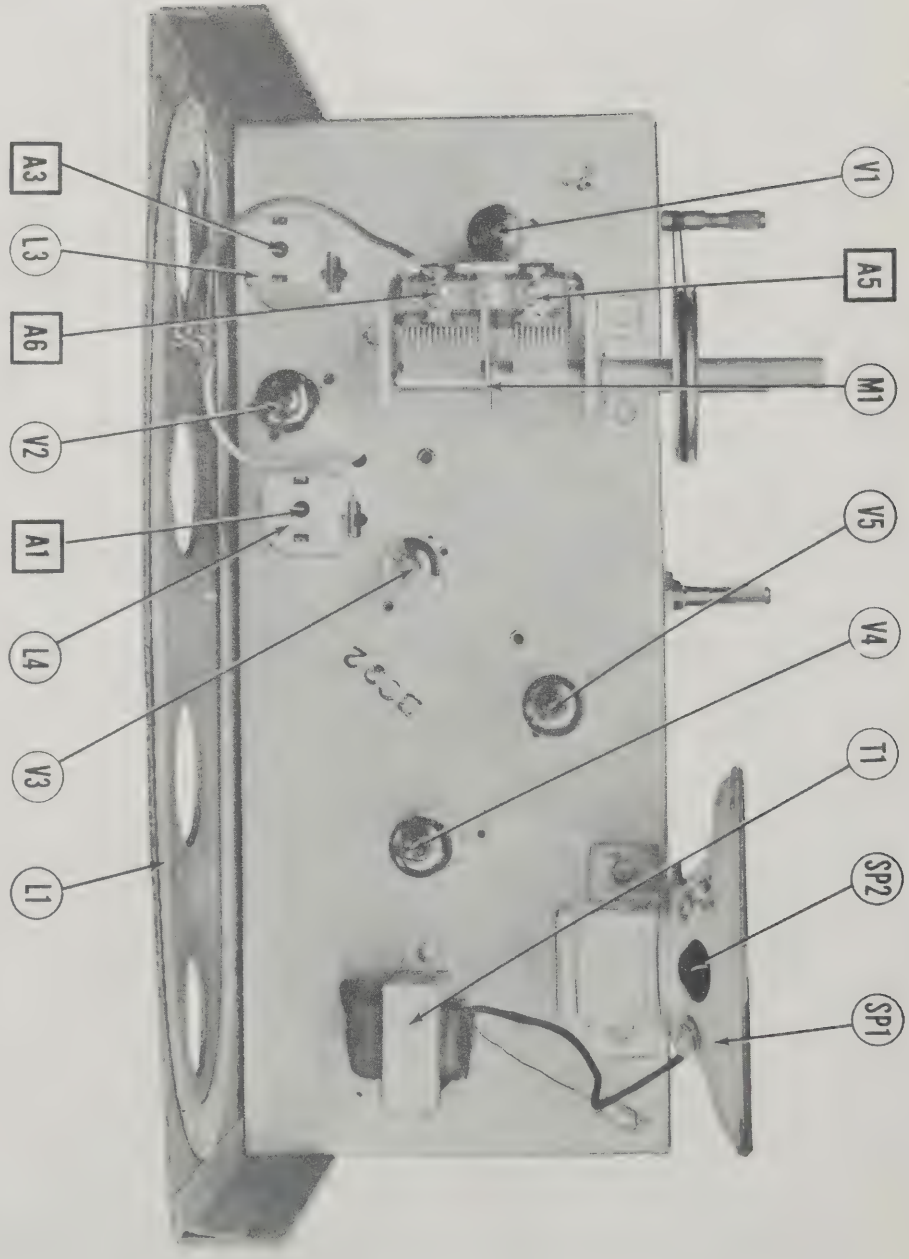
ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: STEW.-WARN. PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	510161	BTS-22K	Osc. Grid
R3	3.3 Meg.	½	510194	BTS-3.3 Meg.	AVC Network
R4	150Ω	½	510122	BW-½-150	IF Cathode
R5	10 Meg.	½	510197	BTS-10 Meg.	AF Grid
R6A	470KΩ	½	*	BTS-470K	AF Plate
B	470KΩ	½		BTS-470K	Output Grid
R7	220Ω	½	510125	BW-½-220	Output Cathode
R8	2200Ω	1	510243	BTA-2200	Filter

* Items R6A, R6B, C7A, C7B are combined into one unit obtainable under MFGR'S Part No. 505858.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA: Stew.-Warn. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	1700Ω	3.6Ω	220Ω Tap ⓐ 9.5Ω	.6Ω	508146	A-3330 ①	A-3031 ①	RO-3 ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

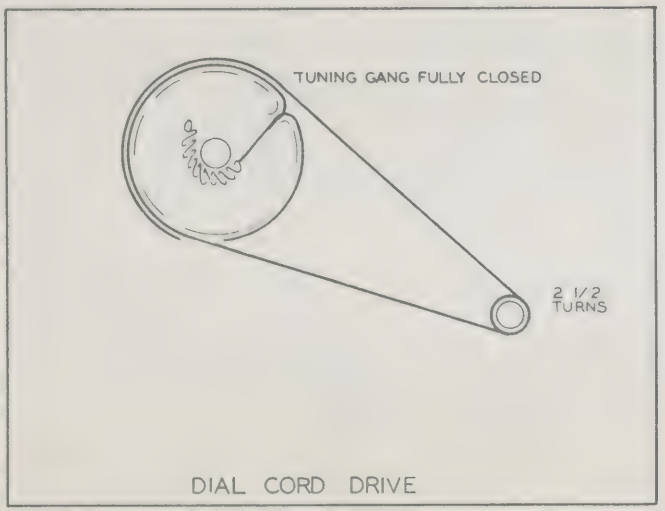
ITEM No	RATINGS		REPLACEMENT DATA STEW.-WARN. PART No.	JENSEN PART No.	QUAM PART No	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113 ③		② Use universal mounting bracket provided.
SP1	PM	3.6Ω	506079	MOD. P4-X	4A07 2	③ Fabricate new mounting bracket.
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

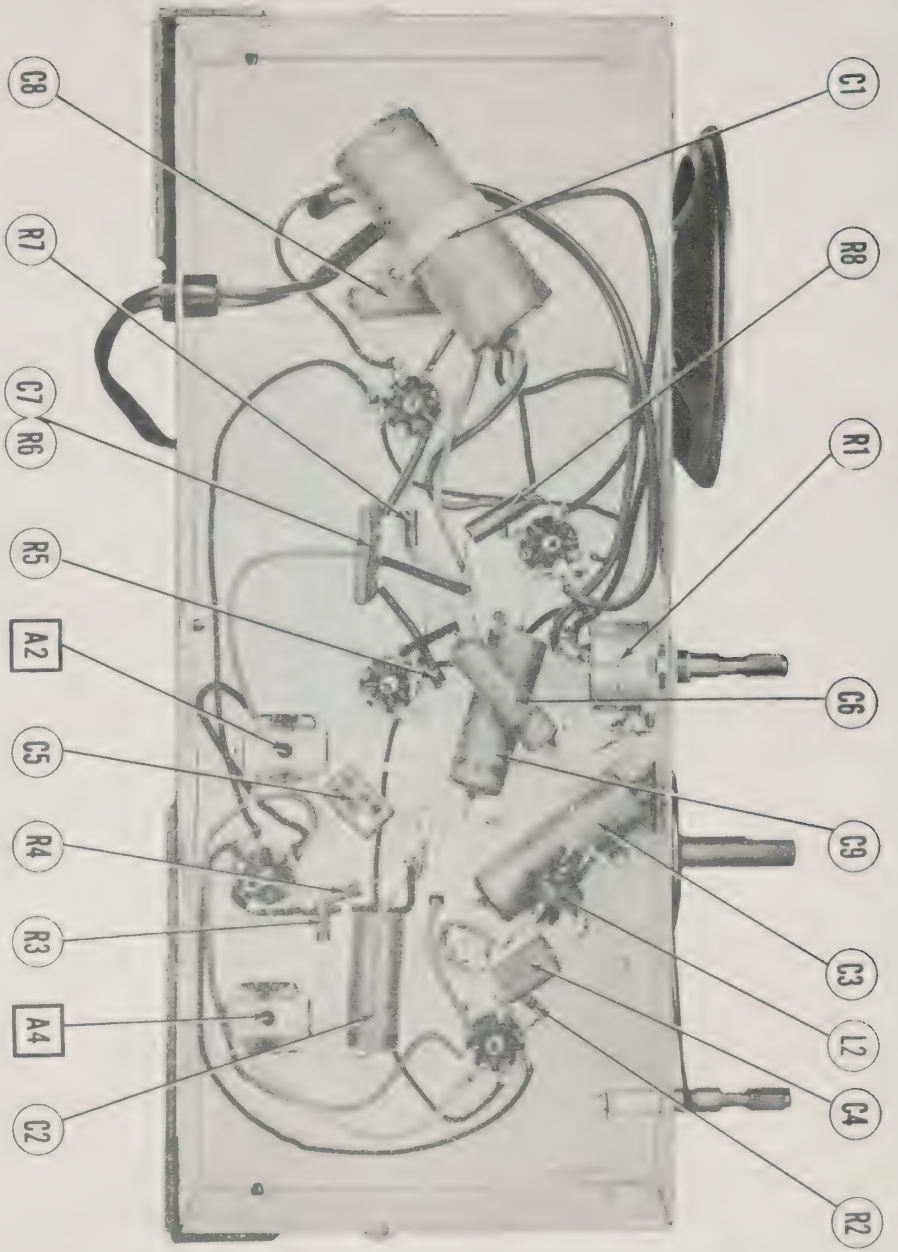
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Stew.-Warn. PART No.	MEISSNER PART No.
L1	Loop Ant.	3.3Ω		508148	
L2	Osc. Coil	.5Ω	3.2Ω	506094	14-1073
L3	1st IF	20Ω	20Ω	505867	16-6758
L4	2nd IF	20Ω	20Ω	505867	16-6758

MISCELLANEOUS

ITEM No.	PART NAME	STEW.-WARN PART No.	NOTES
M1	2 Gang Var. Cap.	508143	(25-397MMF, 32-242MMF)
	Cabinet	508643	Model 9152-A
	Cabinet	508644	Model 9152-B
	Cabinet	508645	Model 9152-C
	Dial Scale	508246	
	Knob	508247	Green
	Knob	508658	Brown



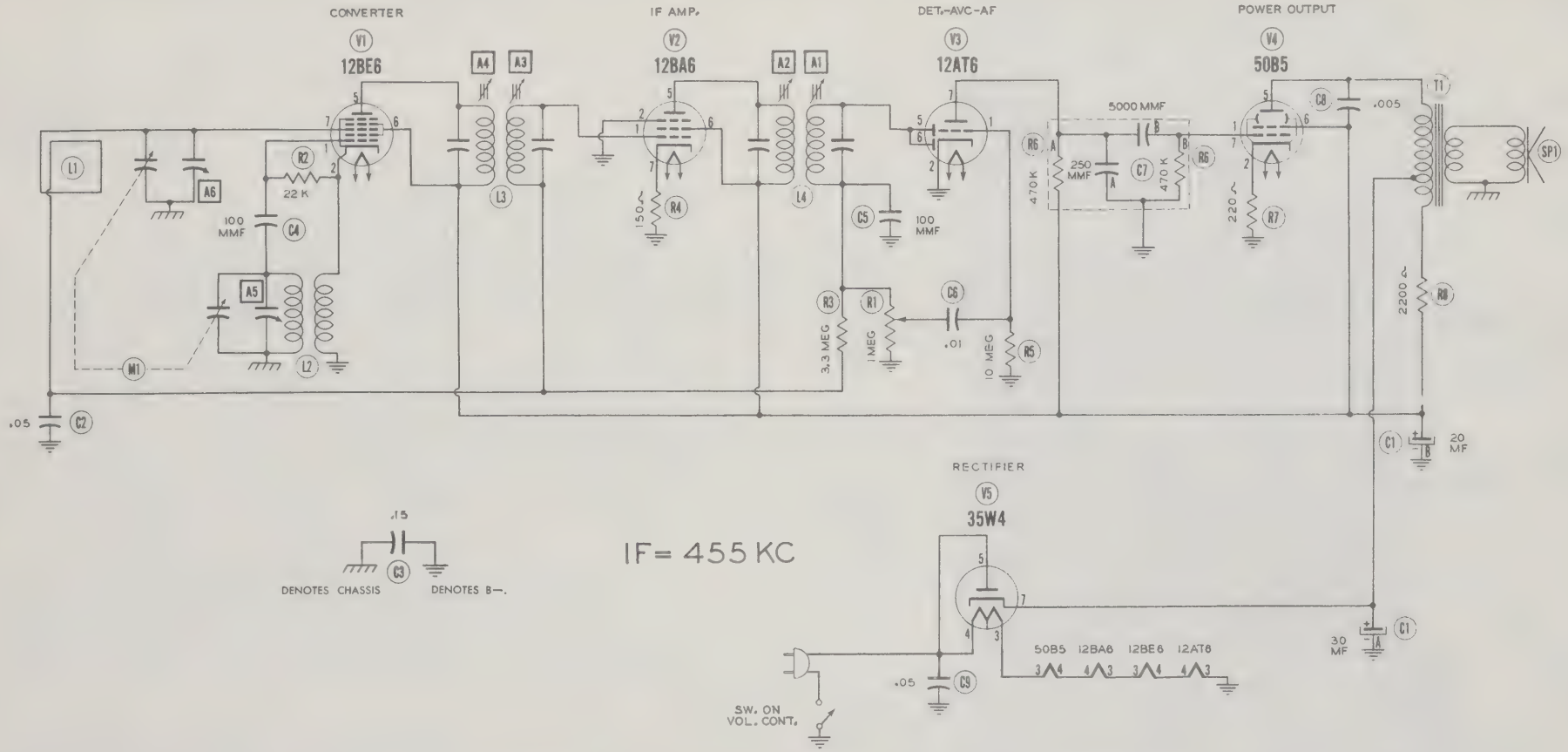
CHASSIS—BOTTOM VIEW



SET 102 FOLDER 14

STEWART-WARNER MODEL 9152-A

STEWART-WARNER MODEL 9152-A



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-5.8VDC	0V.	25VAC	13VAC	90VDC	90VDC	-1VDC
V 2	12BA6	-.2VDC	0V.	25VAC	38VAC	90VDC	90VDC	1.2VDC
V 3	12AT6	-.7VDC	0V.	0V.	13VAC	-.6VDC	-.6VDC	38VDC
V 4	50B5	.2VDC	7VDC	83VAC	38VAC	125VDC	90VDC	.2VDC
V 5	35W4	135VDC	0V.	83VAC	117VAC	117VAC	110VAC	135VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	26Ω	13Ω	†2.2KΩ	†2.2KΩ	4.3 Meg.
V 2	12BA6	4.3 Meg.	0Ω	26Ω	39Ω	†2.2KΩ	†2.2KΩ	150Ω
V 3	12AT6	10 Meg.	0Ω	0Ω	13Ω	1 Meg.	1 Meg.	†470KΩ
V 4	50B5	470KΩ	220Ω	90Ω	39Ω	†210Ω	†2.2KΩ	470KΩ
V 5	35W4	†9.5Ω	Inf.	90Ω	125Ω	125Ω	115Ω	70KΩ

† MEASURED FROM PIN 7 OF V5.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

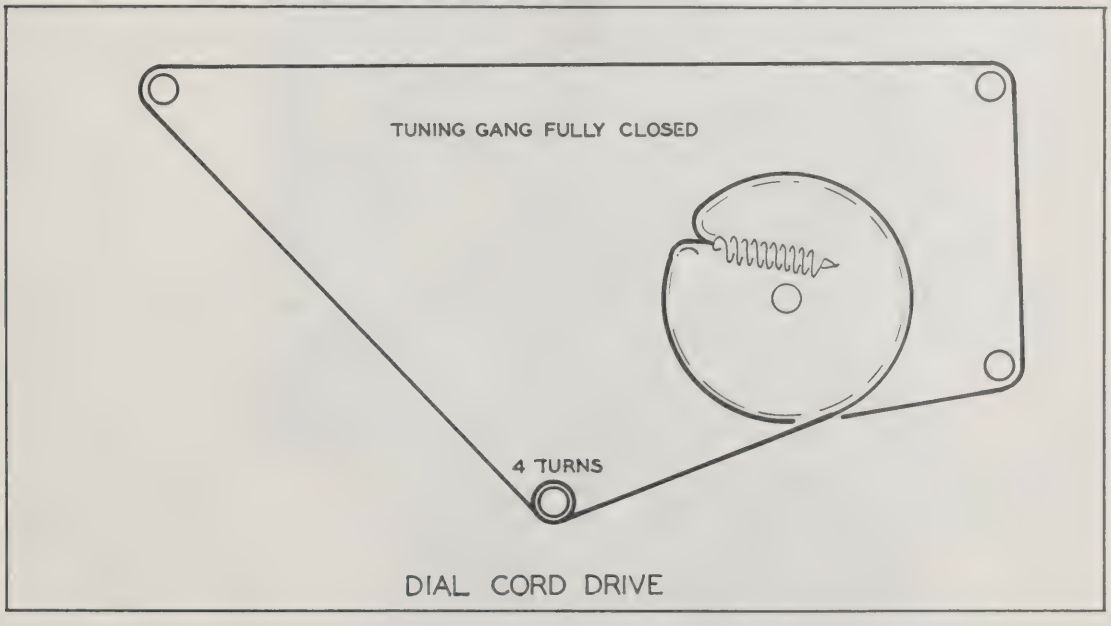
© Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

TRUETONE MODEL D1046A

TRADE NAME	Truetone, Model D1046A (Fact. Model 27A96-952)		
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.		
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES (EIGHT)	Types 12AT7 FM RF-FM Mixer, 6BE6 FM Osc.-AM Conv., 6BA6 IF Amp., 6BA6 Limiter, 6AL5 Discriminator, 6AV6 DET-AVC-AF, 6V6GT Power Output, 6X5GT Rectifier		
POWER SUPPLY	105-125 Volts AC	RATING	.37 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1600KC	FREQ. MOD.	88-108MC

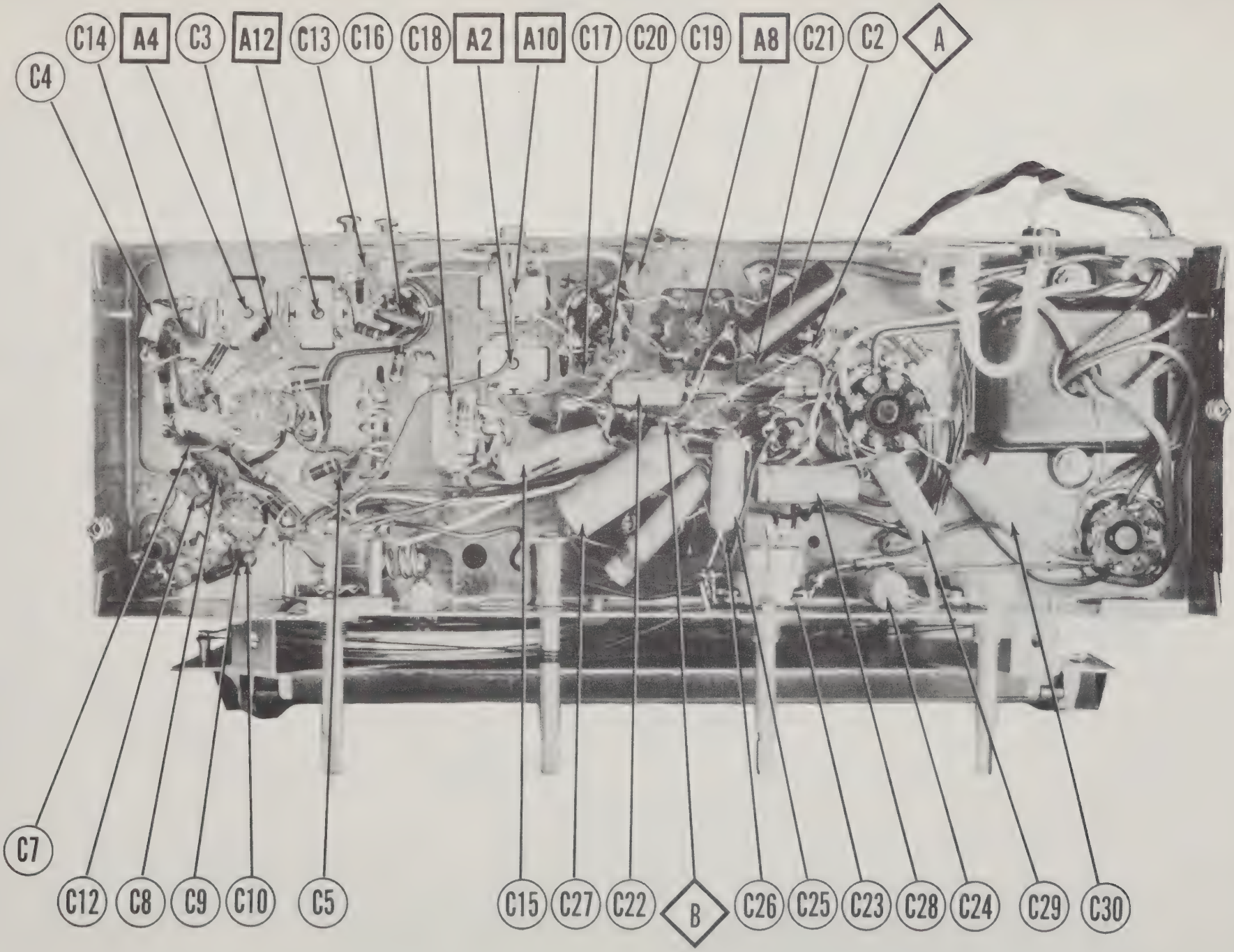
FOR SERVICE INFORMATION ON RECORD CHANGER SEE MODEL 700F 33/45
PHOTOFACT SET 75 FOLDER 11

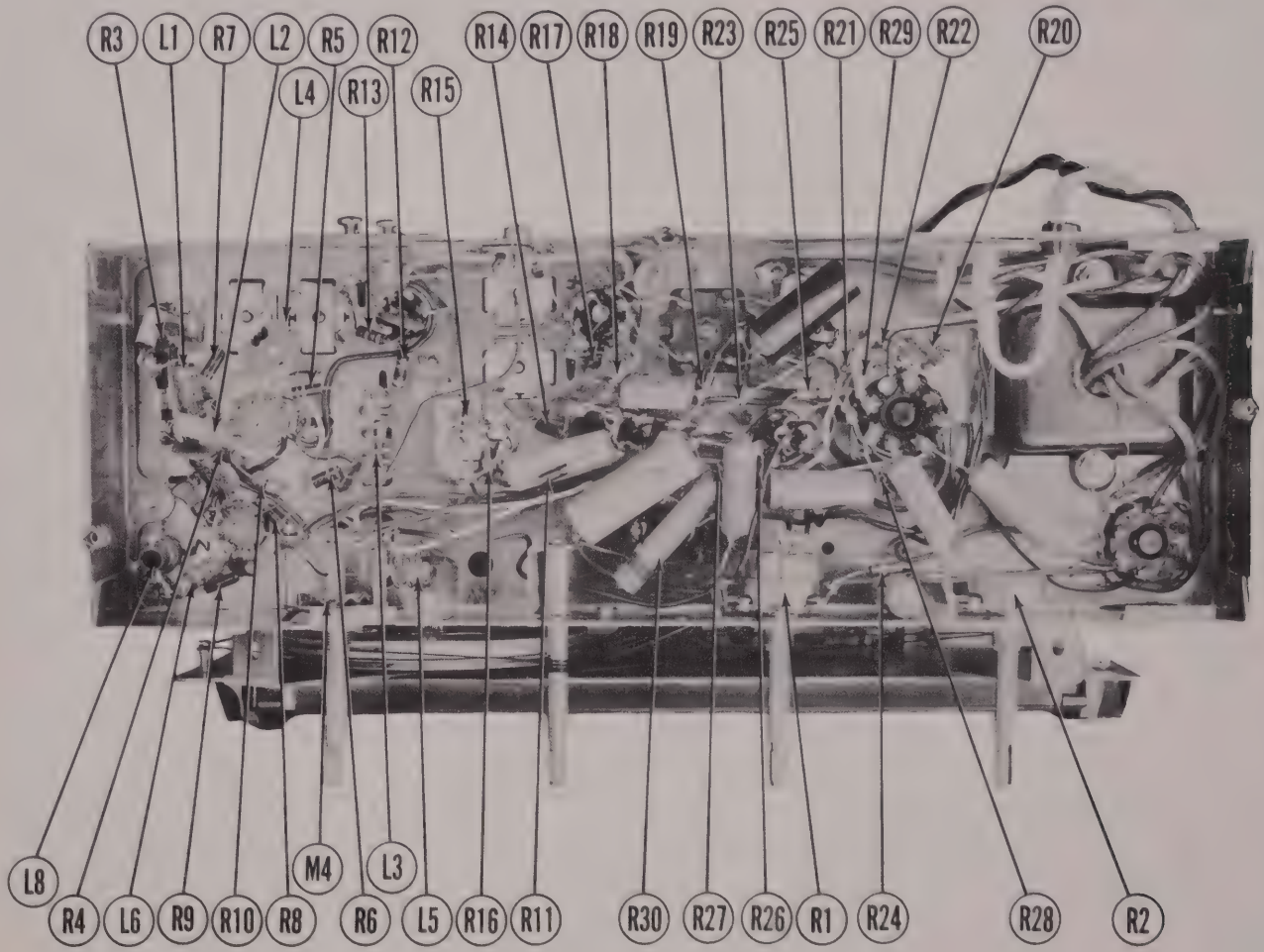


DIAL CORD DRIVE

TRUETONE
MODEL D1046A

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


C14
A4
C3
A12
C13
C16
C18
A2
A10
C17
C20
C19
A8
C21
C2
A
C4
C7
C12
C8
C9
C10
C5
C15
C27
C22
B
C26
C25
C23
C28
C24
C29
C30


R3
L1
R7
L2
R5
R12
L4
R13
R15
R14
R17
R18
R19
R23
R25
R21
R29
R22
R20
L8
R4
L6
R9
R10
R8
M4
R6
L3
L5
R16
R11
R30
R27
R26
R1
R24
R28
R2

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BE6 (V2). Low side to chassis.	455KC (400∿ Mod.)	AM (center position)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	.1MFD	"	1620KC	"	"	"	A5	"
3.		Loop	1400KC	"	Tune for max. output	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	2500MMF	High side to pin 1 (Grid) of 6BA6 (V4). Low side to chassis.	10.7MC (Unmod.)	FM (CW)	Tuning gang fully open	DC Probe to Point (A). Common to chassis.	A7	Adjust for maximum deflection.
5.	"	"	"	"	"	DC Probe to Point (B). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
6.	"	High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis.	"	"	"	DC Probe to Point (A). Common to chassis.	A9, A10, A11, A12	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	2500MMF	High side to pin 1 (Grid) of 6BA6 (V3). Low side to chassis.	10.7MC (450KC Sweep)	FM (CW)	Tuning gang fully open	Vert. Amp. to Point (A). Low side to chassis.	A7, A9, A10	Disconnect stabilizer capacitor C2. Adjust for maximum amplitude and symmetry as per fig. 1.
5.	"	High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis.	"	"	"	"	A11, A12	"
6.	"	"	"	"	"	Vert. Amp. to Point (B). Low side to chassis.	A8	Reconnect capacitor C2. Adjust A8 so 10.7MC occurs at center of crossover lines as per figure 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	300Ω carbon res.	High side thru 300Ω to ungrounded "FM" antenna terminal. Low side to chassis.	108.5MC (Unmod.)	FM	Tuning gang fully open	DC Probe to Point (A). Common to chassis.	A13	Adjust for maximum deflection.
8.	"	"	104.5MC	"	Tune for max. deflection.	"	A14	"

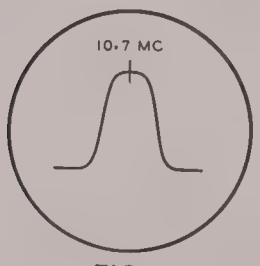


FIG. 1

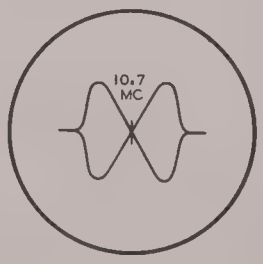
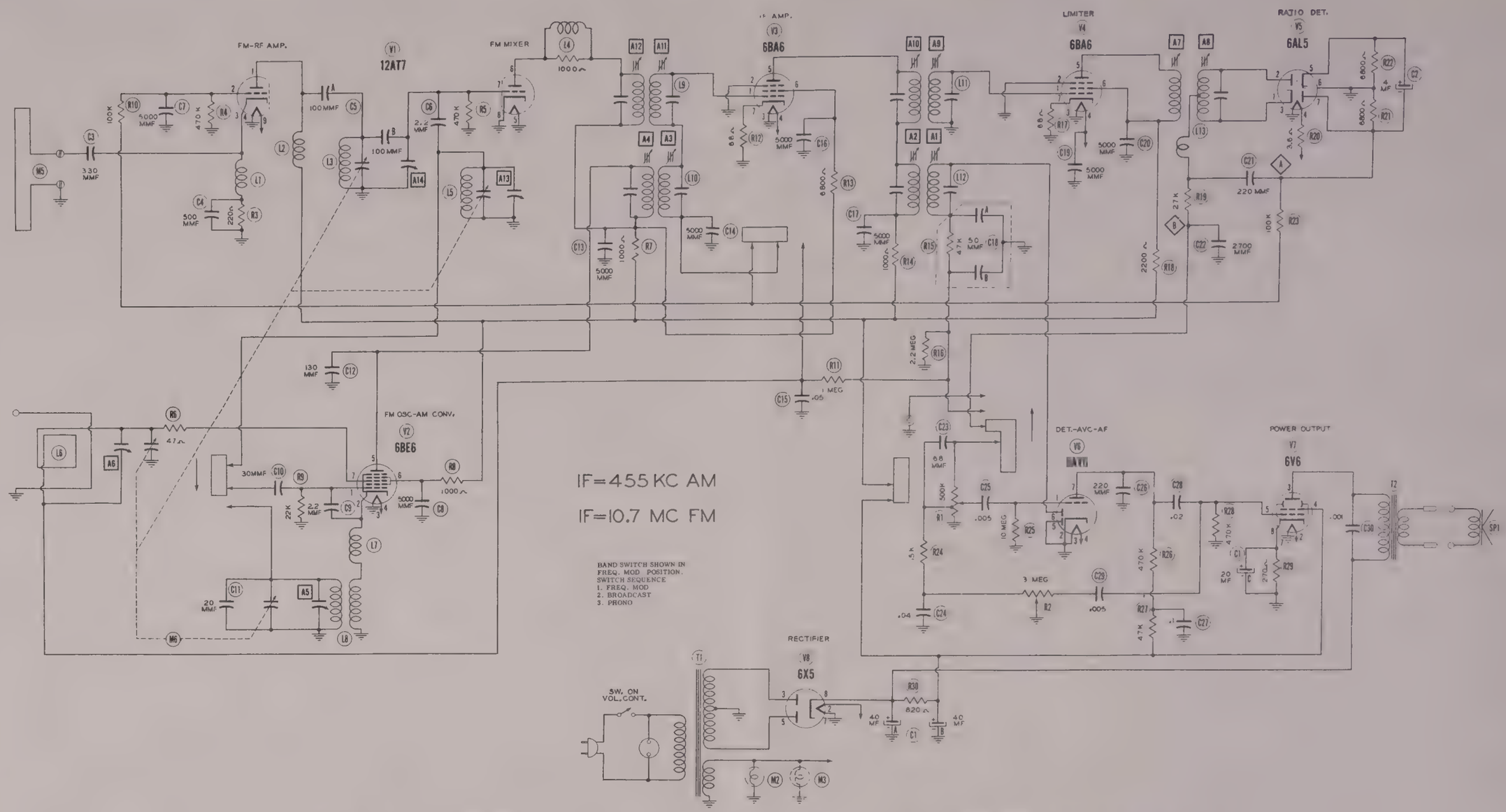


FIG. 2



VOLTAGE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AT7	130VDC	.1VDC	1.2VDC	0V.	0V.	120VDC	-1.3VDC	0V.	6.3VAC
†	V2	6BE6	1-2.3VDC	.1VDC	0V.	6.3VAC	115VDC	115VDC	-1.2VDC		
#	V2	6BE6	1-4.6VDC	.1VDC	0V.	6.3VAC	115VDC	115VDC	-.3VDC		
#	V3	6BA6	.3VDC	0V.	0V.	6.3VAC	120VDC	90VDC	7VDC		
†	V4	6BA6	0V.	0V.	0V.	6.3VAC	100VDC	100VDC	1.1VDC		
†	V5	6AL5	-.1VDC	-.1VDC	0V.	5.3VAC	.1VDC	0V.	-.1VDC		
#	V6	6AV6	-.5VDC	0V.	0V.	6.3VAC	0V.	-.3VDC	80VDC		
#	V7	6V6GT	0V.	6.3VAC	160VDC	125VDC	0V.	0V.	0V.	5.7VDC	
#	V8	6X5GT	0V.	0V.	165VAC	0V.	165VAC	0V.	6.3VAC	170VDC	

$ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
†	V1	12AT7	†820Ω	150KΩ	220Ω	0Ω	0Ω	†1.8KΩ	470KΩ	0Ω	1Ω
†	V2	6BE6	22KΩ	2.4Ω	0Ω	1Ω	†1.8KΩ	†1.8KΩ	2.5 Meg		
*	V2	6BE6	22KΩ	2.4Ω	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	1.2 Meg		
#	V3	6BA6	1.2 Meg.	0Ω	0Ω	.1Ω	†1.8KΩ	18.6KΩ	68Ω		
†	V4	6BA6	1Ω	0Ω	0Ω	.1Ω	†3KΩ	†3KΩ	68Ω		
†	V5	6AL5	400KΩ	400KΩ	0Ω	3.6Ω	6.8KΩ	0Ω	6.8KΩ		
#	V6	6AV6	10 Meg.	0Ω	0Ω	.1Ω	0Ω	380KΩ	†520KΩ		
#	V7	6V6GT	Inf.	.1Ω	†475Ω	†820Ω	470KΩ	1Ω	0Ω	270Ω	
#	V8	6X5GT	Inf.	0Ω	130Ω	Inf.	130Ω	Inf.	.1Ω	80KΩ	

† MEASURED FROM PIN 8 OF V8

TAKEN IN "AM" POSITION.
† TAKEN IN "FM" POSITION

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	FM RF Amp. -FM Mixer	12AT7	12AT7	9A	
V2	FM Osc. -AM Conv.	6BE6	6BE6	7CH	
V3	1st IF Amp.	6BA6	6BA6	7BK	
V4	2nd IF Amp.	6BA6	6BA6	7BK	
V5	Disc. -FM AVC	6AL5	6AL5	6BT	
V6	DET-AVC-AF	6AV6	6AV6	7BT	
V7	Power Output	6V6GT	6V6GT	7AC	
V8	Rectifier	6X5GT	6X5GT	8S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	200	45X360	AF88J4A		UP4445C		EL-432	▲ Filter
B	40	150							■ Filter
C	20	25							▲ Output Cath. Byp.
C2	4	100	45X361	PRS150/4		BR415		UT-41	Stabilizing Cap.
C3	330	500	47X470	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	RF Coupling
C4	500		47X508	GP500M	D6-501	5W5T5	GP2K-500	1FM-35	FM RF Cath. Byp.
C5A	100		76X4	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
B	100			GP100M	D6-101	5W5T1	GP1K-100	1FM-31	RF Coupling
C6	2.2		47X557		TCZ-2.2				Osc. Coupling
C7	5000		47X507	BPD-5	DD-502	1D5D5	811-005	29C1	AVC Filter
C8	5000		47X507	BPD-5	DD-502	1D5D5	811-005	29C1	Osc. Anode Byp.
C9	2.2		47X557		TCZ-2.2				Osc. Feedback
C10	30		47X558	SI30JN750	TCN-30	5W5Q3	N750K-30	MS-43	Osc. Grid Cap.
C11	20		47X516	CI20KN600			N600K-20		Fixed Trimmer
C12	130		47X559	SI130KN750	TCN-130		N750K-130		Fixed Trimmer
C13	5000		47X507	BPD-5	DD-502	1D5D5	811-005	29C1	Conv. Plate Decoupling
C14	5000		47X507	BPD-5	DD-502	1D5D5	811-005	29C1	AVC Filter
C15	.05	200	BB66503	P288-05	DF-503	PTE4S5		TM-15	AVC Filter
C16	5000		47X507	BPD-5	DD-502	1D5D5	811-005	29C1	1st IF Screen Byp.
C17	5000		47X507	BPD-5	DD-502	1D5D5	811-005	29C1	1st IF Plate Decoup.
C18A	50		47X112	GP50M	D6-500	5W5Q5	GP1K-50	1FM-45	Diode RF Filter
B	50			GP50M	D6-500	5W5Q5	GP1K-50	1FM-45	Diode RF Filter
C19	5000		47X507	BPD-5	DD-502	1D5D5	811-005	29C1	2nd IF Fil. Byp.
C20	5000		47X507	BPD-5	DD-502	1D5D5	811-005	29C1	2nd IF Decoup.
C21	220	500	47X468	1468-00025	D6-221	5W5T25	GP2K-220	1FM-325	Diode Load Cap.
C22	2700	500	47X492	1467-0025	D6-272	1W5D25	GP2M-0027	1FM-225	De-emphasis
C23	68	500	47X471	1468-000075	D6-680	5W5Q7	GP1K-68	MS-47	Tone Comp.
C24	.04	200	B66403	P288-04		PTE6S4		TM-14	Tone Comp.
C25	.005	600	D66502	P688-005	D6-502	PTE6D5	811-005	TM-25	Audio Coupling
C26	220	500	47X468	1468-00025	D6-221	5W5T25	GP2K-220	1FM-325	AF Amp. Plate Byp.
C27	.1	400	D66104	P488-1	DF-104	PTE4P1		TM-1	AF Amp. Plate Decoup.
C28	.02	400	D66203	P488-02	DF-203	PTE4S2		TM-12	Audio Coup.
C29	.004	600	B66402	P688-004	D6-402	PTE6D4		TM-24	Tone Comp.
C30	.001	800	H66102	P1088-001		PTE16D1		TR-21	Output Plate Byp.

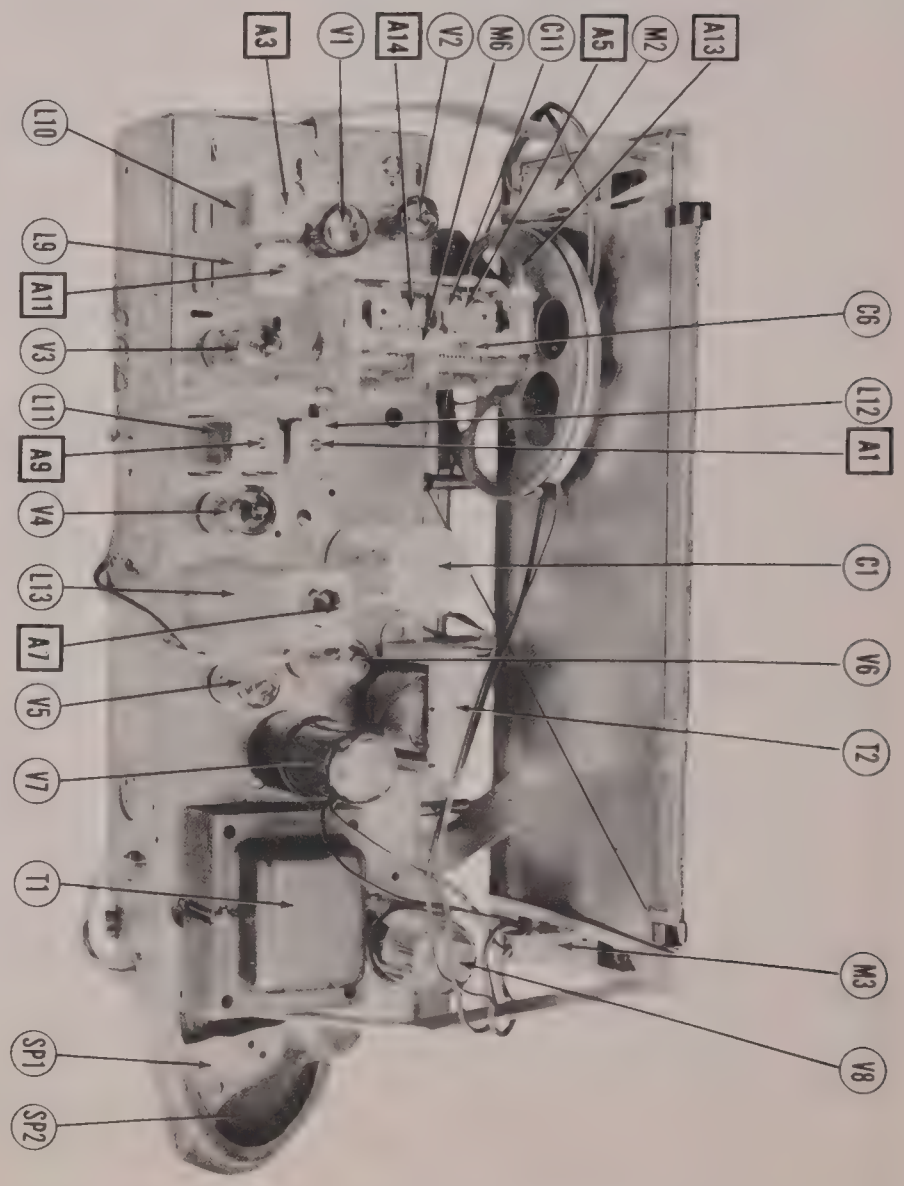
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	36X381	Q18-133X	AT-88	BTSK-66-S	Volume control, tapped at 50KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A per instructions
R2A	3 Meg.	½	40X289	Q13-140	AM-67-Z	AN-85	Tone control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R2A per instructions

SET 102

FOLDER 15

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	TRUETONE PART No.	IRC PART No.	
R3	220Ω	½	B84221		FM RF Cathode
R4	470KΩ	½	B85474	BTS-470K	FM RF Grid
R5	470KΩ	½	B85474	BTS-470K	FM Mixer Grid
R6	47Ω	½	B85470		Parasitic Supp.
R7	1000Ω	½	B85102	BTS-1000	Conv. Plate Decoupling
R8	1000Ω	½	B85102	BTS-1000	Osc. Anode Decoupling
R9	22KΩ	½	B85223	BTS-22K	Osc. Grid
R10	100KΩ	½	B85104	BTS-100K	AVC Network
R11	1 Meg.	½	B85105	BTS-1 Meg.	AVC Network
R12	68Ω	½	B84680		1st IF Cathode
R13	6800Ω	½	B84682	BTS-6800	1st IF Screen
R14	1000Ω	½	B85102	BTS-1000	1st IF Plate Decoupling
R15	47KΩ	½	B85473	BTS-47K	Diode Filter
R16	2.2 Meg.	½	B85225	BTS-2.2 Meg.	Diode Load
R17	68Ω	½	B84680		2nd FM IF Cathode
R18	2200Ω	½	B85222	BTS-2200	2nd FM IF Decoupling
R19	27KΩ	½	B85273	BTS-27K	De-emphasis
R20	3.6Ω	3	43X233		Ratio Det. Filament-Wire Wound
R21	6800Ω	½	B84682	BTS-6800	Ratio Det. Diode Load
R22	6800Ω	½	B84682	BTS-6800	Ratio Det. Diode Load
R23	100KΩ	½	B85104	BTS-100K	AVC Network
R24	15KΩ	½	B85153	BTS-15K	Tone Compensation
R25	10 Meg	½	B85106	BTS-10 Meg.	AF Amp. Grid
R26	470KΩ	½	B85474	BTS-470K	AF Amp. Plate
R27	47KΩ	½	B85473	BTS-47K	AF Amp. Plate Decoupling
R28	470KΩ	½	B85474	BTS-470K	Output Grid
R29	270Ω	2	B84271	BW-½-270	Output Cathode
R30	820Ω	2	D84821	BW-2-820	Filter

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .39A	340VCT .059ADC	6.3VAC @ 2.7A		53X291	P-6119 ①	P-3047 ①	PH-70B ①

① Add series resistor to reduce plate voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	41KΩ	3.6Ω	475Ω	.2Ω	51X134	A-3823	A-2902	RO-8	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			TRUETONE PART No.	JENSEN PART No.	QUAM PART No	
	FIELD	V. C. IMP.		ST-116		
SP1	PM	3.6Ω	12A477	MOD. P8-U	8A21	
	CONE DIA.	V. C. DIA.				
SP2	7 3/8"	9/16"				

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	
L1	RF Choke	.3Ω		35A9		Insulated
L2	RF Choke	3.5Ω		35A8		Insulated
L3	FM Ant.	0Ω		9A2066		
L4	Para. Supp.	0Ω		9A2068		Wound on 1KΩ resistor
L5	FM Osc.	0Ω		9A2067		
L6	Loop Ant.	.8Ω	1Ω	9A1972		
L7	RF Choke	2.5Ω		35A5		
L8	AM Osc.	.6Ω	5.1Ω	9A2065	14-1073	
L9	1st FM IF	1Ω	1Ω	9A2060		
L10	1st AM IF	13.5Ω	11.5Ω	9A2062	16-6678	
L11	2nd FM IF	1Ω	1Ω	9A2061		
L12	2nd AM IF	12.5Ω	14Ω	9A2063	16-6678	
L13	Disc. Trans.	1.2Ω	.2Ω	9A2064		

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	TRUETONE PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		LQD-J	"Q" "Q-33"			

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					TRUETONE PART No.		
M2	Bayonet	6-8	.15	Brown	7A103		Type #47
M3	Bayonet	6-8	.15	Brown	7A103		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Switch	2A395	Band-Phono
M5	Antenna	9A2003	Dipole
M6	2 Gang Var. Cap.	14A209	(17-507MMF, 14-187MMF)
M7	Trimmer	17A256	BC Ant. (A6)
	Knob	10X751	
	Dial Glass	58X730	
	Dial Pointer	15X254	

FIGURE 1

FIGURE 2

V-M
MODELS 406, 407

V-M
MODELS 406, 407

GENERAL INFORMATION

The V-M Model 406 and 407 Tri-o-matic Record Changer Intermix model is designed to play standard 78 RPM, 45 RPM and 33 1/3 RPM records of standard commercial dimensions. Records up to 12" diameter can be played manually.

Features of this changer include playing and automatically changing as many as ten 12", twelve 10", or any assortment of ten records, intermixed. Intermix only ten-inch and twelve-inch records of the same type, either standard (78 RPM) or long play (33 1/3 RPM).

A full stack of 12 — 7", 33 1/3 RPM records, or a full stack of 12 — 7", 45 RPM records (with the adapter inserted in the record) will also play on this changer. Changer shuts off after the last record has been played.

Connect this changer only to an outlet supply 117 volts, 60-cycle AC unless otherwise specified. Power consumption 25 watts.

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

COPYRIGHT 1950 • ALL RIGHTS RESERVED

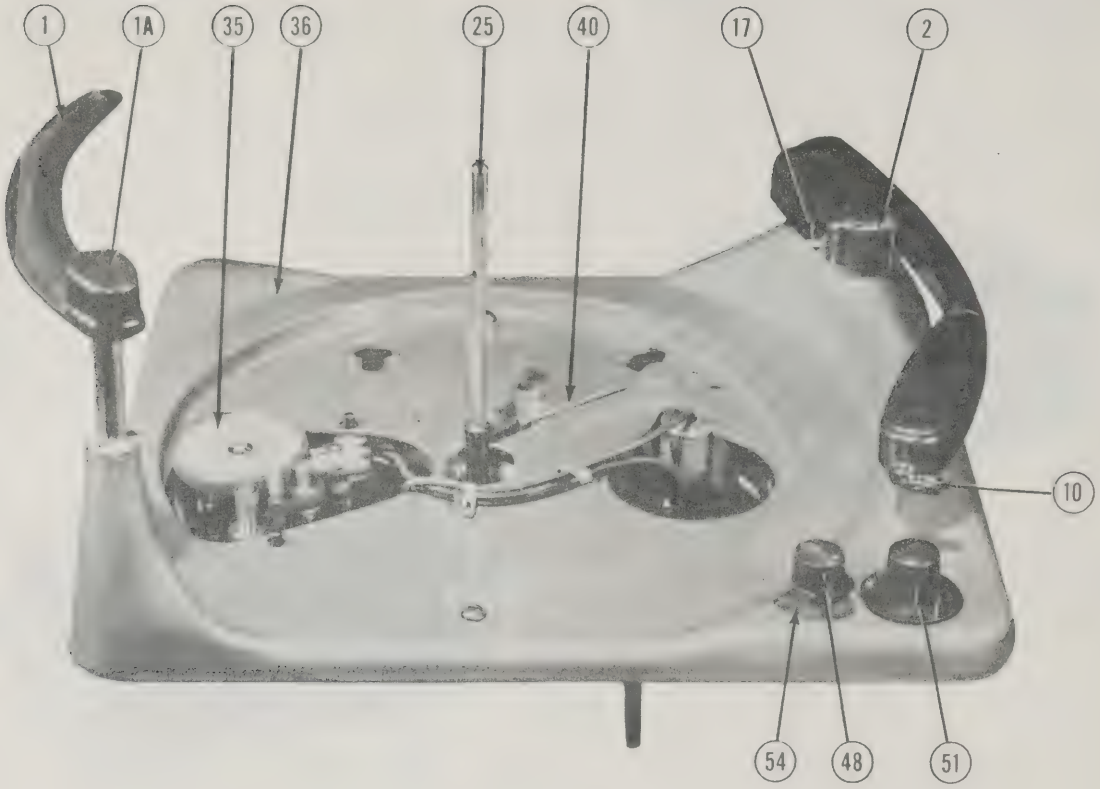


FIGURE 3

PREPARING FOR OPERATION

SHIPPING BOLTS: Before placing in operation, the machine must be floated freely on the mounting springs. During shipping, the mechanism is secured by means of the two shipping bolts. To float the changer, remove the turntable by lifting it straight up the spindle. Turn the two shipping bolts in a clockwise direction as far as they will go and replace the turntable. Before the turntable can be fully seated, the drive wheel must be gently pushed back out of the way to prevent damage to rubber tire.

LEVELING RECORD CHANGER: It is essential to have the record changer absolutely level. Use a torpedo or similar type level on the record changer baseplate. Use adequate shims to level the record changer pan or radio combination cabinet to achieve perfect level.

OPERATING

Loading

1. Pull straight up on record support knob until record support clears spindle. Swing record support to the left until pin in shaft drops into locating groove.

2. Changer will automatically play ten 12″ either standard or long play, twelve 10″ either standard or long play, any assortment of ten 12″ and 10″ records intermixed, or twelve 7″ long play or fine groove records.

NOTE: Standard, fine groove and long play records cannot be played in same stack of records. Motor speed and needle control knobs must be reset for each type of recording.

3. Place records on spindle and lower to offset shelf. Hold records level and replace record support over spindle.

To Play Standard Recordings

1. Motor speed control knob must be in the "78" position.

2. Dual-needle-reversible cartridge control must be in "Std." position.

3. To start, turn changer control knob to "Rej." and release. Changer will operate automatically until the last record has been played. Pickup arm returns to rest and the control knob to "Off" position. Changer automatically stops.

To Play Long-Play (33⅓ RPM) Records

1. Motor speed control knob must be in the 33-10″-12″ position for 10″ or 12″ long play 33⅓ RPM records, or in the 33-7″ position for 7″ long-play 33⅓ RPM records.

2. Dual-needle-reversible cartridge control lever must be in "Slow" position.

To Play Fine-Groove (45 RPM) Records

1. Motor speed control knob must be in the 45 position for 7″ fine groove 45 RPM records; however, these records are manufactured with a 1½″ spindle hole. It is essential that a record adapter be inserted into each 45 RPM record to be played. This is necessary to reduce the spindle hole to the conventional size.

2. Dual-needle-reversible cartridge control lever must be in "Slow" position.

REJECTING: To reject a record at any time while changer is operating, turn changer control knob to "Rej." and release.

STOPPING: To turn off changer before automatic shut-off, turn changer control knob to "Off." Lift pickup arm and place on rest.

UNLOADING: Lift the record support and swing to left until pin on shaft drops into locating groove. Lift stack of records straight up off spindle.

MANUAL OPERATION: To play single records or home recordings, lift up the record support arm and move it to left, clear of the turntable. Place record on spindle and lower to spindle

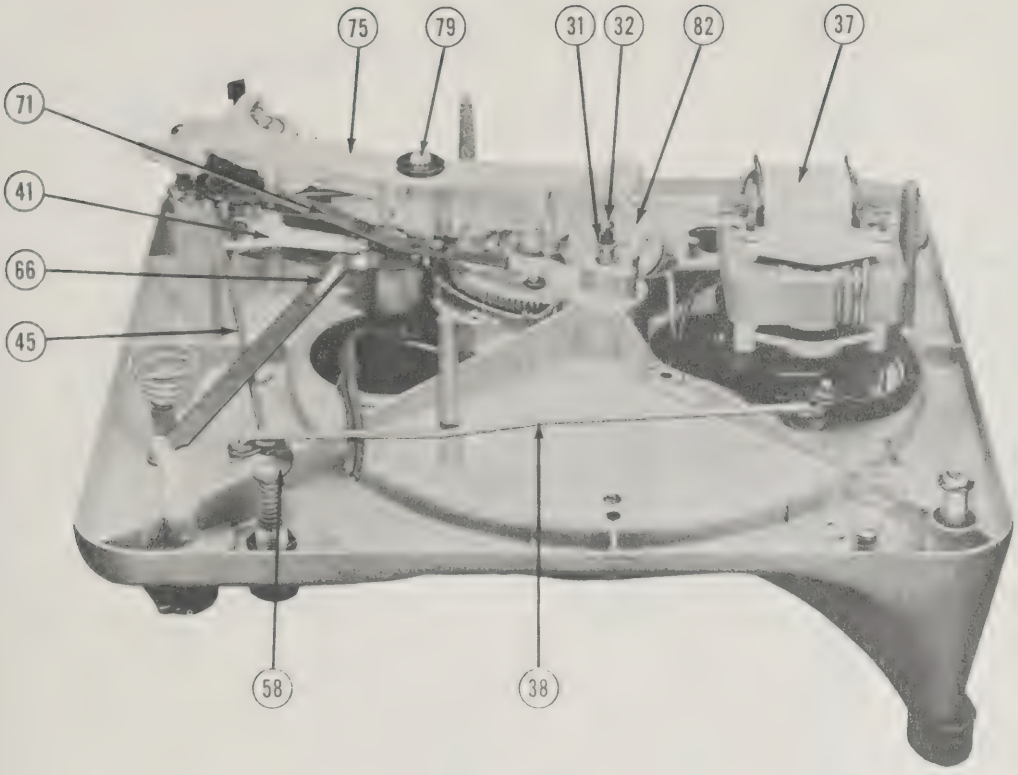


FIGURE 4

shelf. Tilt record down toward the rear of pickup arm and lower record to turntable. Turn changer control knob to "On" position, and trip index trigger on inside rear of pickup arm. Raise pickup arm and place the needle in lead-in groove of record.

REPEATING OF 7", 10" OR 12" RECORDS: To repeat, place record on the turntable, the record support off spindle, start changer. Record repeats until control is turned to "Off." If a 12" record is repeated, wait for the changer to finish cycling and reposition the pickup arm manually to the 12" position.

SUGGESTIONS: When loading and unloading the changer, use care to prevent bending of spindle. Records should not be left on the spindle except during operation of changer. Records will warp. When machine is not in use, it is suggested that speed control be left in "78" position and cartridge control lever be left in the "Std." position. For best reproduction, keep needle and records clean. Store records flat, in folders or in albums. Do not lay record on record.

CAUTION: When changing needles, be certain that slow needle is placed in the slow side of cartridge and standard needle in the standard side. A distinctive color identifies the slow side of the cartridge and slow needle.

Velocity Trip

This changer is provided with what is commonly known as a velocity trip rather than a ratchet and positive trip mechanism. A velocity trip depends, for the tripping action, on the rate of forward motion of the pickup arm with respect to the turntable rotation. The changer will trip only when the pickup arm advances more in one revolution of the turntable than the distance between normal grooves in a record. Only records having fast finishing grooves before the eccentric cycling groove will operate the velocity trip.

FUNCTION OF VELOCITY TRIP: During the normal playing cycle, the trip pawl (84) is contacted with a wiping action by a small projection on the turntable hub. This repeated action prevents the trip pawl from engaging the projection while the pickup arm moves *slowly* toward the spindle.

A stud on the locator housing (59) contacts the trip link (71) when the pickup arm nears the end of a record. The end of the trip link nearest the spindle contacts the trip lever and turns it as the pickup arm advances. The trip lever, through spring washer tension, turns the trip pawl. Small motions of the trip pawl are not sufficient to cycle the mechanism because, on each revolution of the turntable, the wiping contact by the hub projection moves the trip pawl back to clear the projection.

In the first revolution of the turntable, during which the pickup arm advances rapidly, the trip pawl is moved far enough for the sharp point at the end to definitely engage the projection on the turntable hub, thereby turning the cam to start the change cycle.

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use, or high operating temperature, the changer should be lubricated as follows (refer to the exploded view):

Apply Lubriplate to

1. Hinge bearing (21).
2. Locator housing (59) and set-down locator plate (67).
3. Cam faces on lift arm (75), lift arm bearing and lift arm cutoff rod bearings.
4. Between lever spring (70) and cutoff rod (69).
5. Heart-shaped cam track on cam (82) and cam bearing.
6. Spindle between roller plunger and roller spring housing and between the roller spring housing and the spindle body.
7. Turntable ball bearing.

Apply a Small Quantity of Light Mineral Oil to

1. Pickup arm locator assembly bearing (55) and ball bearing in pickup arm post.
2. Control lever bearing (41).
3. Turntable and spindle bearing.

ADJUSTMENTS

Needle Set Down (refer to the exploded view)

The set-down position of the needle is adjusted by means of the two adjusting screws (11). If the needle is setting down too far out on the record, loosen the back screw about ¼ turn and tighten the front screw to lock the adjustment in place. If the needle is setting down too far in on the record, loosen the front screw and tighten the back screw. When correct set down is

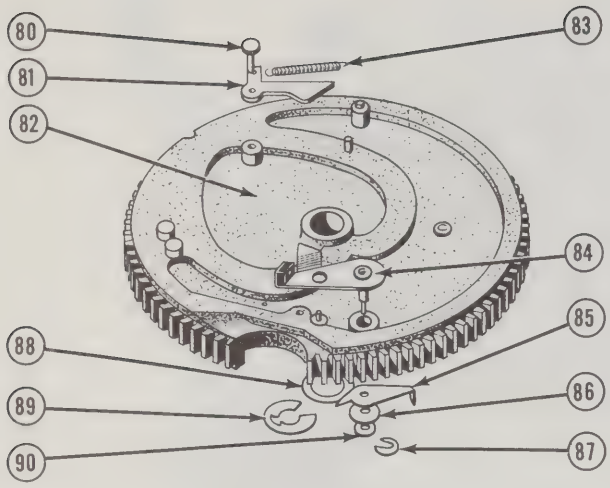


FIGURE 5

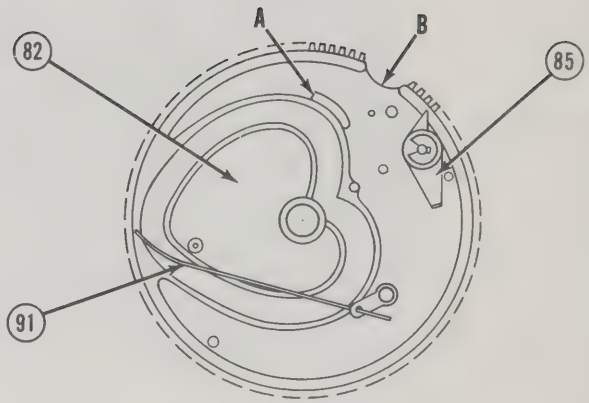


FIGURE 6

obtained for the 10″ position, the 12″ and the 7″ needle set down will also be correct.

Pickup Arm Height (refer to the exploded view)

The pickup arm height is adjusted by the screw (19) located on top of the pickup arm lift rod (62). Turn the screw out or in until the underneath side of the pickup arm clears the rest by ⅛″ to 3/16″.

NEEDLE PRESSURES: With the pickup arm control lever in "Std." position, the needle pressure should be between 1 and 1.25 oz. There is no adjustment for "Std." play pressure inasmuch as the pickup arm is designed to give this needle pressure.

With the pickup arm control lever in the "Slow" position, the needle pressure should be between 7 and 12 grams. If the pressure is in excess of 12 grams, the drilled end of the hinge bracket (18A) should be bent back away from the hinge bearing assembly (21). NOTE: A very slight bend of this bracket will cause a considerable change in needle pressure. If the pressure is less than 7 grams, correction may be made by bending the drilled end of the hinge bracket forward in the direction of the hinge bearing assembly.

In no case should the needle pressure in the "Slow" position be less than 7 grams. If this pressure is lower than 7 grams, the needle will not track in the record grooves. This may be recognized by "skidding" of the pickup arm across the record and by failure of the changer to cycle at the end of the record. Improper tracking may be due to other causes. (See heading "Needle Does Not Track Across Record Properly.") An accurate scale, calibrated in grams, must be used in checking this needle pressure.

1. *Defective Cartridge (Shure P 77-A)*

To remove cartridge, proceed in the following manner:

1. Remove the plastic cartridge control lever.

2. Carefully pull the cartridge lead up from the rear section of the arm until adequate slack is obtained.

3. Remove the two screws that are used to attach pickup cartridge to the pickup cartridge mounting bracket.

4. Disconnect the pickup leads and remove cartridge.

5. Replace cartridge and connect pickup leads.

6. Secure pickup cartridge to pickup cartridge mounting bracket.

7. Push excess pickup lead into rear section of pickup arm and reinstall plastic cartridge control lever.

Damaged Needle (Shure-P 77 A)

To remove needle, proceed in the following manner:

1. Rotate cartridge control lever to correspond with needle to be removed.

2. Loosen knurled thumb nut that secures needle to the cartridge.

3. Carefully remove the needle and replace with a new needle of the same part number.

CAUTION: *Make sure that the colored needle is used on the side of the pickup cartridge having the corresponding color spot.* The replacement needle will have to be adjusted, before it is tightened in the pickup cartridge, to assure that the needle shank is securely held by the knurled thumb nut. *Do not use pliers on knurled thumb nut. Tighten with fingers only.*

2. *Defective Cartridge (Webster F-14)*

To remove cartridge, proceed in the same manner as described in (1—"DEFECTIVE CARTRIDGE).

Damaged Needle (Webster F-14)

To remove needle, proceed in the following manner:

1. Remove plastic cartridge control knob (10).

2. Using a jeweler's screwdriver, loosen the set screw in the end of the cartridge enough to remove the dual needle.

3. Replace with new needle, making sure the red-coated needle is on the same side as the red dot on the cartridge.

4. Center needle in cartridge and tighten set screw.

5. Replace cartridge control knob.

3. *Defective Cartridge (Astatic LQD)*

To remove cartridge, proceed in the same manner as described in (1—"DEFECTIVE CARTRIDGE").

Damaged Needle (Astatic LQD)

1. Rotate cartridge control knob to correspond with needle to be removed.

2. The needle may now be removed by pulling it straight out of its mounting.

3. In replacing the new needle, make sure that the colored needle is used on the side of the pickup cartridge having the corresponding color spot.

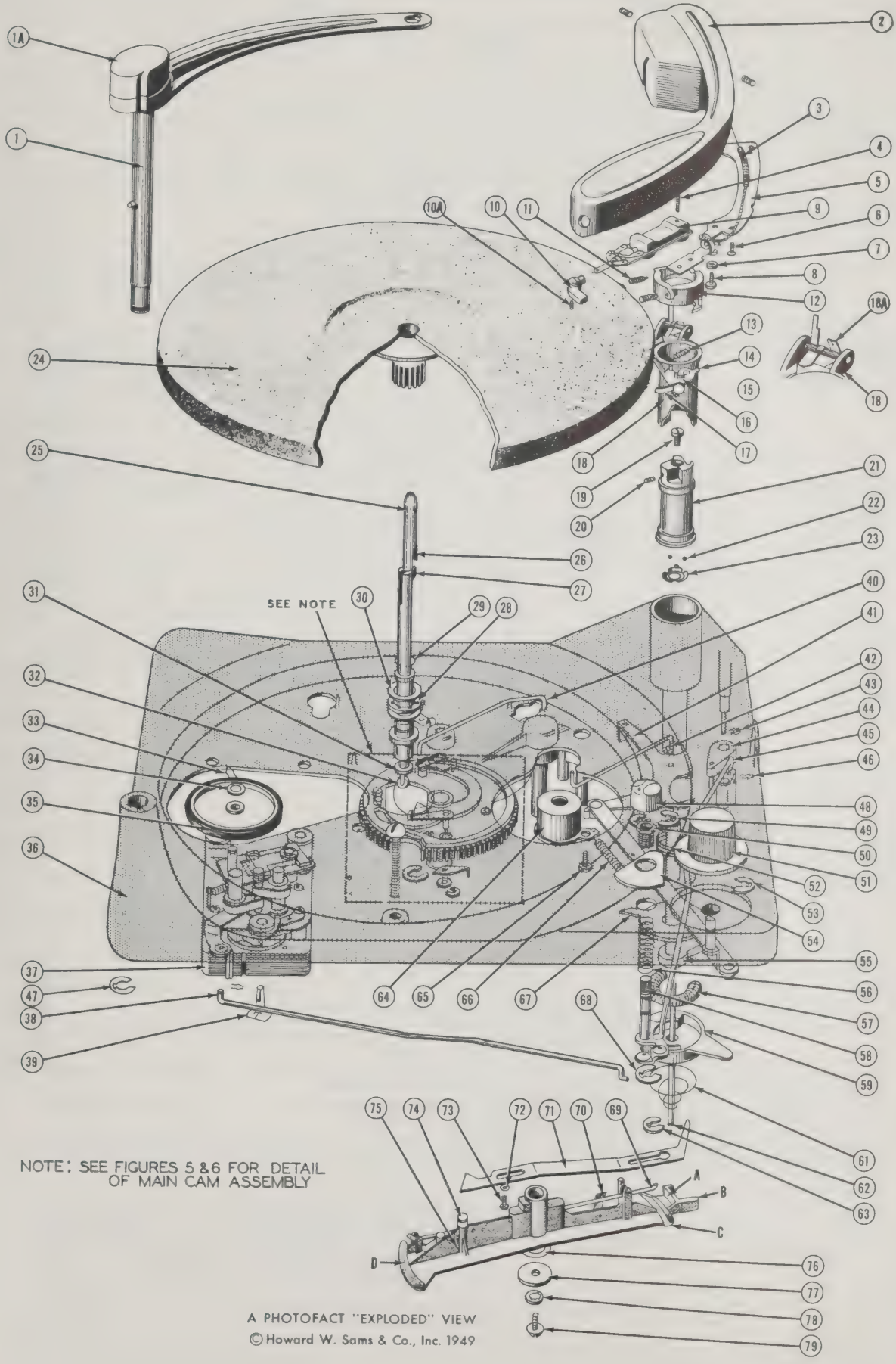

SEE NOTE
NOTE: SEE FIGURES 5 &6 FOR DETAIL OF MAIN CAM ASSEMBLY
A PHOTOFACT "EXPLODED" VIEW
© Howard W. Sams & Co., Inc. 1949

FIGURE 7

TROUBLE CHART

SYMPTOM	CAUSE	REMEDY
Control knob (51) cannot be turned to "On" position.	1. Machine shut off during cycle.	Turn the turntable clockwise, by hand, until the control knob (51) is free.
Turntable (24) does not revolve when control knob (51) is turned to "On" position.	1. Machine stalled in cycle.	Turn the turntable clockwise, by hand, until it starts rotating under its own power.
	2. No current at motor (37).	a. Check to determine if current is reaching A.C. leads of changer. b. Check the switch (64) to determine if it is closing. c. Check wiring and soldered terminals in the changer.
	3. Motor (37) defective.	Remove turntable to allow motor to operate without load. If current is reaching motor and pulley does not rotate, the motor is defective. Repair or replace.
	4. Motor idler wheel (35) not engaging turntable rim.	If motor pulley is turning but turntable is not: a. Check motor idler assembly to determine if it is free to contact the motor pulley and the turntable. b. Wipe off the inside rim on the turntable to remove flock, or if oily, clean the turntable rim and rubber tire of the idler wheel (35), shown in exploded view, with carbon tetrachloride.
Changer does not cycle when the control knob is turned to the "Rej." position (refer to exploded view).	1. The manual reject not actuating the trip.	Turn the control knob (51) to the reject position, hold, and see if the reject link (40) on the control lever (41) is contacting the trip pawl (84) on the main cam (82). This should actuate the trip pawl (84) to engage with pinion gear on the turntable hub. When the trip rod (40) is turned and the cam pawl (84) on the main gear figure (5) does not move forward, engaging the teeth on the turntable hub, check for binding between the cam pawl (84) and the cam. If binding occurs, clean out all foreign matter and check for freedom, but do not lubricate.
Record does not drop when changer cycles (refer to figure [4] and exploded view).	1. Spindle pusher shaft broken.	If the pusher shaft (inside the spindle) is broken, the roller assembly (32) will drop out of the spindle. Loosen the spindle holding set screws and remove the spindle assembly (25). Replace with a new spindle unit.
	2. Pusher in spindle not moving far enough forward to eject a record.	The pusher (27) should move up inside the spindle body, then move forward until it has reached a point flush with, or a maximum of .010" beyond the spindle body. To assure that the pusher is all the way forward, the spindle roller, part of the pusher and roller assembly (32), should be raised high enough by the lift arm (75), at the top of the cam face, to slightly compress the roller spring inside the pusher housing. (See "Turntable Stalls During Cycle.") If the roller is compressed and the pusher (27) does not move far enough forward to eject a record, the spindle should be replaced. If a record is not pushed completely off the ledge, it may hang up on the spindle momentarily, then drop on the pickup arm when it moves in over the turntable.
	3. Lift screw loose.	Check screw (79) to determine if it is turned all the way in.
	4. Pusher raises outside spindle body.	When the changer cycles, the pusher (27) should first rise inside the spindle body, then move forward inside the center hole in the record. If the pusher rises outside the spindle body, it will raise the record instead of pushing it off the spindle ledge. Remove the spindle and replace with a complete new spindle assembly.
	5. Lift arm roller broken off.	If the lift arm roller (74) is broken off, the lift arm (75) will not turn when the cam revolves.
Two records drop at once (refer to the exploded view and figure [3]).	1. Hole in record too large.	Check the diameter of the hole in the record. An oversize hole will cause two records to drop at once.
	2. Spindle slide not fully down.	If spindle slide is not all the way down, more than one record may be dropped at a time. a. Check the slide to be sure it is free and does not bind at any point. Clean out foreign matter, or straighten if necessary. Do not oil. b. When records are placed on the spindle, be sure the slide is all the way down. The slide will normally raise slightly as a record is being dropped, but it should return to place immediately.
	3. Record support binding on spindle, or bent out of square with the shaft.	The record support must be able to slide freely, by gravity, down the spindle. If the support does not follow the records down as they are being ejected, two or more records may be ejected at once. If binding occurs: a. Check the spindle to determine if it is straight. Bend carefully with fingers, if necessary. b. Straighten the record support (1) if it is not square with the record support shaft. c. If the hole in the record support is not centered over the spindle after checking (a) and (b), bend the support shaft post on the baseplate until the hole in the record support is centered over the spindle. d. When the pin in the record support shaft has just entered the slot in the record support shaft post on the baseplate, the play in the record support, as it is swung from one side to the other, should be equal on both sides of the spindle. To correct bent condition, hold the support shaft and carefully force the record support into the proper position. If the support is loose on the shaft, remove the knob and restake with hammer and punch.
	4. Record pusher defective.	The record pusher (27) may be deformed, etc. This may cause two records to drop at once. Replace with a new spindle assembly or pusher (27).
Record hits pickup arm (refer to the exploded view).	1. Pusher in spindle not moving far enough to eject record.	(See "Record Does Not Drop When Changer Cycles"—2.)
	2. Lift arm screw loose.	Tighten lift arm screw (79).

SYMPTOM	CAUSE	REMEDY
	3. Pusher extending beyond outside diameter of spindle.	Cycle changer, by hand, until roller assembly (32) is at the top of its travel. Using new record as a gauge, pass it over the spindle to see if it binds at any point. File off high points on pusher (27), with a fine file, until record will pass freely over spindle.
	4. Pickup arm not adjusted properly.	The adjustment procedure for the needle set-down point is given under "ADJUSTMENTS." If the hinge bearing (21) has been removed, or the hinge bearing set screw (20) has been loosened, the relationship between the hinge bearing and the pickup arm locator assembly (55) must be reset. The procedure is as follows: a. Loosen the set screw (20) sufficiently to allow the hinge bearing to slide on the pickup arm locator assembly shaft. The set screw may be adjusted with an Allen wrench through the hole in the adjusting ring (12) located between the two adjusting screws (11). b. Place a 1/32" shim between the set-down locator (67) and the locator housing (59). c. Turn the control knob to the "Off" position. d. Raise the pickup arm and rotate the hinge assembly counterclockwise as far as it will go. In this position, the arm extending from the set-down locator should be engaged by the turned-down leg on the control lever (41). e. Take up all the play between the parts by pressing up on the bottom of the locator housing and down on the top of the hinge bearing. f. Tighten the hinge body set screw (20) and remove the shim.
Needle does not set down on 10" record in proper position (refer to the exploded view).	1. Pickup arm not adjusted properly.	(See "Record Hits Pickup Arm"—4.)
	2. Hinge catch (14) does not return to 10" record position when changer cycles.	a. Stop the machine in mid-cycle when the lift arm (75) has moved as far out as it will go and is about to move back to its starting position. Lift the pickup arm and see if there is a gap of at least 1/64" between the end of the leg on the catch (14) and outside step on the adjusting ring (12). The catch should be free to allow it to be pulled forward against the stop at the end of the leg on the adjusting ring. If there is not enough gap, check the setting of the hinge body and the pickup arm locator. (See "Record Hits Pickup Arm"—4.) If the setting is incorrect, the cam face on the lift arm (75), which contacts the round stud on the bottom of the locator housing (59), may be bent. The locator housing should be forced around far enough to bring the pickup arm out until the stop on the bottom of the hinge casting meets the stop in the baseplate; then, to assure that the pickup arm is out as far as it will go, the lift arm should move the locator housing a few degrees farther around, which will slightly compress the safety spring (57) and hold the pickup arm out firmly against the stop. b. Lubricate the hinge bearing with lubriplate. Do not use heavy grease. If the bearing between the hinge bearing and hinge body binds, the safety spring will compress instead of bringing the hinge body around firmly against the stop.
	3. Binding between safety spring and locator housing.	a. If the safety spring (57) binds against the locator housing and does not hold the casting on the bottom of the pickup arm locator assembly (55) against the stop inside the locator housing, irregular needle set down will result. Disassemble the pickup arm locator assembly (55) by removing the lift arm (75) loosening the hinge bearing set screw (20), and pulling the locator housing and pickup arm locator assemblies down from the bottom of the changer. Hold the pickup arm locator shaft in one hand, turn the locator housing assembly to slightly compress the safety spring release, and see if the safety spring returns the pickup locator casting firmly against the stop surface in the locating housing assembly. If binding occurs, remove the safety spring to see if the pickup arm locator casting turns freely in the locator housing casting. Remove burrs or sharp edge on end of safety spring, stretch safety spring a little to increase tension, and replace. b. Check to see if the locator plate (67) is meshing with the locator housing when the lift rod (62) is positioned at the beginning of the sloping cam surface (C) of the lift arm (75) in the final stage of the cycle. To test the meshing of the locator plate and the locator housing, swing the pickup arm half way in toward the spindle. If the locator plate and locator housing disengage when in the above position, it is necessary to reset the clearance between the locator plate and the locator housing. Also, it may be necessary to file off any burrs which may be present on the mating surfaces of the locator plate and the locator housing.
	4. Hinge catch does not disengage from the hinge cam.	When the index lever (17) has been depressed, it is held in the position until the catch (14) is disengaged. (See "Needle Does Not Set Down on 12" Record in Proper Position"—6.) When the cycle is completed, if the catch does not disengage from the hinge cam (16): a. Check to determine if the leg on the catch (14) is sliding down the incline on the leg of the adjusting ring (12). (See "Needle Does Not Set Down on 12" Record in Proper Position"—7.) b. The catch (14) and the hinge cam (16) are not disengaging when the catch leg is resting on the inside step on the adjusting ring. If this occurs, file the edge of the catch which contacts the hinge cam until the two parts have a clearance between them of about 1/64" when the leg on the catch is on the inside step on the adjusting ring.

TROUBLE CHART—*Cont.*

SYMPTOM	CAUSE	REMEDY
	5. Needles may be bent.	If the set-down point of the needle is different in the "Slow" play from the "Std." play, it is possible that one or both needles may become bent through rough handling. *Do not attempt to straighten the needle while it is mounted in the pickup cartridge case.* (Refer to "Damaged Needle" for instructions in needle removal.) Place bent needle on hard, flat surface and carefully straighten until ends of needle are symmetrical. Do not attempt to straighten any needle that has been in use for a considerable period of time, but rather, replace with a new needle.
Needle does not set down on 12" record in proper position (refer to the exploded view).	1. Diameter of 12" record undersize.	The set-down position of the needle for 12" records is determined by the edge of the record striking the index lever (17). If a 12" record has a diameter of less than the standard size of 11 7/8", plus or minus 1/32", it may fail to depress the trip lever far enough.
	2. Enlarged center hole in record.	An enlarged center hole might fail to set the trip lever because it could produce the same effect as a small record.
	3. Pickup arm not adjusted properly.	(See "Record Hits Pickup Arm"—4.)
	4. Binding between safety spring and locator housing.	(See "Needle Does Not Set Down on 10" Record in Proper Position"—3.)
	5. Index lever does not cock when 12" record drops.	Allow a 12" record to drop to the turntable and stop the changer just after it falls, before the pickup arm has a chance to move in over the record. The index lever should be forced down until the step on the hinge cam (16) passes the edge of the catch (14), preventing the hinge cam and the index lever from returning to their original position. If the trip lever does not stay down in a depressed position: a. Check the catch (14) to see if it is free to move forward and engage the hinge cam. b. If the stop on the hinge body (18) is defective, it might allow the pickup arm to move too far out, thus moving the index finger away from the spindle. This would produce the same effect as an undersize record.
	6. Hinge catch does not go into inside step on adjusting ring when index lever is depressed.	When the index lever (17) is tripped by a falling 12" record, the leg on the catch (14) should be moved out over the incline between the inside and outside steps on the adjusting ring leg and held in that position by the shoulder on the hinge cam (16) until the pickup arm starts to move in over the record. When this occurs, the leg on the catch should contact the incline and be moved out as it slides down the incline until the catch is disengaged and the index lever can snap back up to a horizontal position. If the leg on the catch is not moved out far enough to enable it to slide down the incline, file about a 1/64" chamfer on the edge of the catch leg which contacts the incline. Check for binding between hinge body (18) and hinge bearing (21). Burrs on the bearing surfaces or lack of lubrication may prevent the hinge bearing from turning freely.
	7. Needles may be bent.	Refer to paragraph 5 under "Needle Does Not Set Down on 10" Record in Proper Position."
Needle does not track across record properly.	1. Needle may be clogged by accumulation of lint, dirt, etc., or sapphire tip may be chipped.	a. Clean foreign material from around needle. b. Check needle to see if the tip is bent or broken. Replace if necessary. Refer to paragraph on "Damaged Needle."
	2. Locator housing does not disengage from the set-down locator when a cycle is completed.	There should be a 1/32" gap between the locator housing and the set-down locator when the machine is not in cycle. If the gap is small enough to allow the parts to touch and bind as the needle moves across the record, the hinge bearing must be reset. (See "Record Hits Pickup Arm"—4.)
	3. Hinge bearing binds.	Place a block under the back end of the pickup arm to prevent the needle from touching the turntable. With sensitive gram scale, check the amount of force required to move the pickup arm across the turntable. The force required should not exceed 3 grams. If the pressure required is excessive: a. Check the locator housing and set-down locator for binding. (See 1, above.) b. Check the bearing in the pickup arm post for binding. The bearing is located below the hinge bearing (21). To inspect it, loosen the set screw (20) in the hinge bearing. Unsolder the pickup leads and pull them out. Pull up on the hinge and pickup assemblies. Clean foreign matter or corrosion from the bearings; lubricate with light mineral oil. (To reset position, see "Record Hits Pickup Arm"—4.)
	4. Changer not level.	(See "Leveling Record Changer During Long Play" under "Preparation for Operation.")
	5. Excessive vibration during a long play.	Any vibration caused by (1) unsteady mounting, (2) floor vibration, or (3) passing of heavy vehicles may cause the pickup to glide across the record grooves.
Changer trips before needle reaches end of record.	1. Hole in record too large.	If the hole in record is too large, the groove may turn eccentric with the spindle and cause premature tripping.
	2. Binding of trip link.	With the trip link released, check the trip link for freedom of motion. It should be free to move without binding.
Changer does not cycle when record has been played.	1. No eccentric trip groove on record.	All standard records made today have a finishing groove, but some records made in the past did not have this groove. When records of this type are being played, the control knob must be turned to "Rej." at the end of the record.
	2. Needle jumps out of grooves in record.	a. Check trip pressure—the lateral pressure should not exceed 3 grams. (If the pressure is excessive, see "Changer Trips Before Needle Reaches End of Record.") Suspend the pickup approximately 2" to 5" above the record changer. Using a gram scale, measure the amount of horizontal pull on the pickup arm after the arm has become engaged with the locator trip assembly.

TROUBLE CHART—*Cont.*

SYMPTOM	CAUSE	REMEDY
		b. The record may be defective. The finishing groove is often too shallow. Check with a record which is known to be good. c. The needle point may be damaged or affected by an excessive accumulation of dust, lint, etc. Check needle pressure as described under "Adjustments." d. There may be binding in the pickup bearing or locator housing. (See 1 and 2—"Needle Does Not Track Across Record Properly.")
	3. Trip pawl binding on cam face.	The trip pawl (84) must be free to move forward and engage the teeth of the turntable hub when the trip link releases it. Check for burrs or foreign matter lodged between the pawl and the cam. Do not oil as this might collect dirt and gum up the pawl.
Pickup arm sticks records on spindle when it raises, or pickup arm rest when it moves out.	1. Pickup arm height not adjusted properly.	(See instructions for adjusting the pickup arm height under "Adjustments.")
Turntable speed too slow (refer to the exploded view).	1. Binding in turntable bearing.	Check the turntable bearing for freedom. Hold the motor idler wheel (35) out of engagement with the turntable and spin the turntable, by hand, to see if it turns readily and coasts for a long time. If binding occurs, remove turntable, foreign matter, and lubricate with light mineral oil.
	2. Motor pulley too small in diameter.	Replace the motor pulley with one having a greater diameter.
	3. Line voltage too low.	The line voltage should not be less than 105 volts or the turntable may be too slow.
	4. Operating temperature too low.	If the machine has been stored in a cold place, or operated in surroundings at a temperature of less than 60°F., the turntable speed may be too slow.
Turntable speed too fast.	Motor pulley too large in diameter.	Replace the pulley with one having a smaller diameter, or grind one or two thousandths off the pulley.
Turntable stalls during cycle (refer to the exploded view).	1. Motor idler not engaging turntable.	(See "Turntable Does Not Revolve When Control Knob Is Turned to 'On Position' "—4.)
	2. Turntable bearing tight.	(See "Turntable Does Not Revolve When Control Knob Is Turned to 'On Position' "—5.)
	3. Operating temperature too low.	(See "Turntable Speed Too Slow"—4.)
	4. Line voltage too low.	The line voltage should not be less than 105 volts.
	5. Binding in drive mechanism.	a. Remove lift arm (75) and hold idler (35) away from turntable, or remove idler wheel. Cycle machine, turning turntable slowly, by hand. The cam should turn freely for the complete revolution without binding at any point. If binding occurs, check for foreign matter in the gear teeth, a bent cam bearing or bent spindle bushing. b. Replace lift arm, loosen spindle set screw and raise spindle high enough to clear the lift arm cam when the machine cycles. Hold the pickup arm lift rod (62) up so the end of the lift rod does not contact the lift arm cam. Cycle the machine, by hand. The entire cycle should be free without binding at any point. If binding occurs, check the lift arm bearing for freedom, and the lift arm roller to be sure it is not bent causing binding in the cam track.
	6. Binding between pickup arm lift rod and lift arm cam face.	Cycle machine, stopping it half way through the cycle just as the lift arm is about to return. Lift pickup arm and raise lift rod (62) by pulling up on the adjusting screw (19) as high as it will go. Feel the lift arm (75) for play. The lift rod may still touch the lift arm cam face, but it should not bind. If binding occurs, the lift arm bearing may be bent or the fiber washer (76) under the lift arm should be removed to lower the lift arm.
	7. Spindle roller spring compressed too far.	Cycle the changer and watch the relationship between the bottom of the pusher housing (part of pusher and roller assembly (31), and the roller (32). Just before the top of the lift arm cam is reached, the pusher housing should stop its upward motion and the roller should continue up .005" to .047" more, slightly compressing the roller spring. If the spring compresses too much, the changer may stall on the shut-off cycle: a. Check the lift arm bearing to determine if it is square with the baseplate. It should be 90° to the baseplate within ¼°. If it is bent, carefully point it into place with a soft mallet. b. If it is straight and the roller spring is being compressed too much, remove the fiber washer (76) between the lift arm and the steel washer. The dimension on the spindle, between the shoulder on which it rests and the bottom of the roller, should be 1⅞" plus or minus .010". An oversize could cause a binding condition.
	8. Motor weak.	In cases where everything checks all right, but the changer still stalls in cycle, the motor may be weak.
Changer continues to cycle.	1. Reject spring (66) loose.	Make certain that the reject spring (66) is secured in position at both ends.
	2. Locator spring (83) loose.	Check the cam locator spring (83) to make certain it has not fallen off or has become unfastened at either end.
	3. Trip link (40) frozen.	Make certain that the trip link (40) is not frozen in the reject position.
	4. Trip pawl (84) binding.	Check the trip pawl (84) on the main cam (82) figure (5) to make certain it does not bind and that it is free of all foreign matter.
Noise during playing of record.	1. Rumble from motor.	If a low-pitched rumbling sound comes from the loud speaker while a record is being played, check the motor grommets to be sure the motor is freely suspended on them. The motor lead wires

TROUBLE CHART—Cont.

SYMPTOM	CAUSE	REMEDY
		should have slack to allow the motor to float. Motor rumble may also come from an out-of-balance motor rotor. In this case, the motor should be replaced.
	2. Defective turntable bearings.	Defective turntable bearings can cause rumble. Check for foreign matter in the bearing, defective balls, binding between balls and ball retainer; rough surface on washers. Clean ball bearings, sleeve bearing and washers; lubricate with lubriplate or light mineral oil.
	3. Defective motor idler wheel (35).	A rapid thumping sound, while the motor is running, may indicate a flat spot on the motor idler wheel (35). If this condition does not clear up after ten minutes of running time, remove the turntable and check the rubber tire on the idler. If the surface of the rubber tire is not smooth and even, replace the idler. Should the bearing of the idler wheel show signs of excessive wear, or be extremely wobbly, the idler wheel should be replaced.
	4. Defective record.	Worn or defective records cause needle scratch and distortion of the recorded sound. If the record is warped, it may slip on the other records causing "Wow," a waver in the recorded sound. An enlarged hole in the record can also cause "Wow."
	5. Turntable scrapes.	If a scraping sound occurs as the turntable revolves, check: a. Turntable warped, causing outer rim to rise and fall. b. Motor idler or mounting plate bent. c. Wires beneath turntable rubbing.
	6. Squeaks.	Squeaking sound as changer operates indicates lack of oil. Lubricate points indicated under "Lubrication."
Distortion of recorded sound.	1. Defective record.	(See 3—"Noise During Playing of Record.")
	2. Defective amplifier.	Check phonograph amplifier and speaker.
	3. Bad cartridge.	Replace.
No sound during playing.	1. Defective cartridge.	Replace. (See "Defective Cartridge.")
	2. Defective wiring.	Check pickup leads for a shorted or open lead.
	3. Defective amplifier.	Check phonograph amplifier and speaker.
Excessive record wear.	1. Binding in pickup arm.	(See 1 and 2—"Needle Does Not Track Across Record Properly.")
	2. Use of "Std." needle on long-play record.	Use of "Std." needle on long-play records will cause excessive wear.
Changer does not shut off after last record has been played (refer to the exploded view).	1. Record support binding on spindle.	The record support (1) must rest on the offset shoulder of the spindle or the changer will not shut off. (See 3—"Two Records Drop at Once.")
	2. Cut-off rod (69) not engaging shoulder pusher housing.	On the shut-off cycle, the end of the cut-off rod (69) should contact the shoulder on the bottom of the spindle pusher housing, part of pusher and roller assembly (31), and turn the cut-off rod over 90°. If the end of the cut-off rod passes under the pusher housing as the machine cycles on the shut-off cycle, check: a. The record support to be sure it is resting on the spindle. (See 1, above.) b. The spindle to see if it is being held in place by the spindle set screws. c. The lift arm screw (79) to be sure it is tight. d. The bent-up end of the cut-off rod (69) may be short. Replace, if necessary.
Changer shuts off prematurely (refer to the exploded view).	1. Spindle roller spring compressed too far.	(See 7—"Turntable Stalls During Cycle.")
	2. Roller spring in spindle too weak.	When the bottom record of a stack of ten 12" records is being ejected from the spindle ledge, the roller spring (in the housing) should not compress until just before the roller reaches the top of the cam incline on the lift arm. If the roller spring is compressed under the load of a full stack of records, it may cause premature shut-off. Replace with a complete spindle assembly (25).
	3. Record too thick.	The changer is designed to play standard records. If an old-style ⅛" thick record is used, the changer will shut off instead of dropping the record.
	4. Cut-off rod not being reset.	After the shut-off cycle, when the cut-off rod (69) has been turned to throw the switch to the "Off" position, it should be returned to its original position, the next time the machine cycles, by the bent-up end of the cut-off rod contacting the round stud on one leg of the control lever (41). The flat spring (70) acting against the cut-off rod should throw the rod against its stop on the lift arm (75) and hold it there. If the cut-off rod is not fully turned, the bent-up end next to the spindle may stick up high enough to prematurely contact the shoulder on the pusher housing, part of pusher and roller assembly (31): a. Check the lever spring (70) for tension. Remove and bend slightly to increase tension if necessary. b. Lubricate the cut-off rod bearings, and around the lever spring, with Lubriplate or light mineral oil. c. Check the clearance between the end of the cut-off rod (69), which passes under the control lever (41), and the bottom of the round stud on the control lever. When the cut-off rod is in its normal operating position, it should not clear the bottom of the round stud by more than enough to completely turn the end of the cut-off rod from vertical position back to a horizontal position.
Turntable continues to rotate when control knob is turned to "Off" position.	1. Switch defective.	Check switch for defect and replace if necessary.
Needle does not set down on 7" record in proper position.	1. Tail on set-down locator plate (67) damaged or bent out of position.	Straighten or replace.

PARTS LIST FOR V-M 406 AND 407

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Ref. No.	Part No.	DESCRIPTION	List Price
1	1799-A	Record support assembly	$1.50
		1711-B Knob	.21
		1716 Cross pin	.05
		1925 "J" support	.42
		2111 Rod	.76
1A	1711-B	Knob	.21
2	2883	Tone arm and hinge assembly	18.62
		713 Screw	.05
		2306 Spacer	.02
		2308 Screw	.02
		2310 Pivot screw	.06
		2370 Knob screw	.03
		2377 Strengthener assembly	.28
		2392-B Tone arm	1.12
		2399 Hinge assembly	2.70
		2493 Spring and chain assembly	.41
		2753 Cartridge with needles (Astatic)	12.11
		2754 One-Mil needle (Astatic)	1.89
		2755 Three-Mil needle (Astatic)	1.68
		2606 Cartridge with needles (Shure)	12.11
		2608 One-Mil needle (Shure)	1.89
		2629 Three-Mil needle (Shure)	1.68
		3063 Cartridge with sapphires (Shure P77-A)	13.65
		3119 Three-Mil sapphire stylus (Shure)	2.80
		3120 One-Mil sapphire stylus (Shure)	2.80
		2197 Cartridge with needles (Webster F-14)	12.25
		2630 Dual needle for Webster F-14	3.62
		2817 Cartridge screw	.03
		2820 Cable and clip assembly	.37
		2860-G Cartridge control knob	.17
3	2493	Spring and chain assembly	.41
4	2817	Cartridge screw	.03
5	2377	Strengthener assembly	.28
6	713	Screw	.05
7	2306	Spacer	.02
8	713	Screw for mounting strengthener	
9		Cartridge (see item 2)	
10	2860-G	Cartridge control knob	.17
11	1580	Adjusting screw	.09
12	1840	Adjusting ring assembly	.79
		1574 Spring	.09
		1577 Adjusting ring	.55
		1580 Adjusting screw	.09
13	1574	Adjusting ring assembly spring	.09
14	1578	Catch (part of item 18)	.07
15	1581	Index cam (part of item 18)	.13
16	1583	Spring catch (part of item 18)	.14
17	1582	Index lever (part of item 18)	.07
18	2043	Complete hinge assembly	3.29
		1512 Hinge bearing assembly	1.27
		1547 Drive pin	.02
		1575 Spring index cam	.06
		1578 Catch	.07
		1579 Drive pin	.06
		1581 Index cam	.13
		1582 Index lever	.07
		1583 Spring catch	.14
		1621 Spring lever return	.09
		1840 Adjusting ring assembly	.79
		1846 Washer—selector	.02
		2042 Hinge body	.33
19	1616-B	Adjusting screw	.02
20	1610	Set screw	.10
21	1512	Hinge bearing assembly	1.27
		1609 Hinge bearing	.89
		1610 Set screw	.10
		3056 Bearing cone	.17
22	724	Ballbearing for tone arm	.02
23		Bearing spacer	
24	2885-A	Turntable assembly	4.20
25	1566	Spindle assembly	8.05
		1518 Spindle shaft	3.50
		1524 Spindle base	1.50
		1527 Pusher spring	.09
		1535 Pin—spindle roller	.13
		1536 Spindle roller	.13
		1552 Record pusher	.35
		1557 Spindle pusher shaft	.68
		1559 Pusher pin	.02
		1560 Pusher shaft spring	.05
		1561 Roller spring housing	.63
		1562 Roller spring	.07
		1564 Groove pin	.07
		1565 Roller plunger	.63
		1676 Guide	.30
		1687 Spring guide	.03
26	1687	Spring guide (part of item 25)	.02
27	1552	Record pusher (part of item 25)	.35
28	2624	Bearing	.37
29	2078	Retaining ring	.02
30	2639	Turntable washer	.14
31	1561	Roller spring housing (part of item 25)	.63
32	1536	Spindle roller (part of item 25)	.13
33		Hairpin clip	
34		Fiber washer	
35	2772	Idler wheel	1.61
36	2660	Baseplate assembly (Model 406)	9.40
	2659	Baseplate assembly (Model 407)	11.35
37	2727	Motor (Gen. Industries 117 V.—60 cycle)	17.50
		2772 Idler wheel	$1.61
		2773 Mounting grommet	.06
		2797 Drive belts, 2 used	.65
	3129	Motor (Gen. Industries 117 V.—60 cycle)	17.50
		2772 Idler wheel	1.61
		2773 Mounting grommet	.06
		3139 Drive pulley 78 RPM	.70
		3140 Drive pulley 45 R.P.M.	.70
		3141 Drive Pulley 33⅓ R.P.M.	.70
38	2823	Index rod	.10
39	1685	Motor fastener	.06
40	2764	Reject rod	
41	2425	Control lever assembly	1.81
		1725 Control link	.09
		1726 Control crank	.38
		1727 Rivet	.03
		2424 Control lever	1.26
42		Reject rod (same as 40)	
43		"C" washer	.02
44		Index cam	
45	2643	Index lever	.16
46	2661	Hairpin clip	
47	2110	"C" washer	.02
48	2198	Knob for speed change	.38
49		"C" washer	
50	2354	Speed control shaft bearing	.10
51	2054-B	On-Off reject knob for Model 407	.38
52		Locator spring	
53	1652	"C" washer for control crank	.02
54	2822	Escutcheon for speed control	.15
55	1522	Pickup locator assembly	.84
		1612 Pickup shaft	.49
		1634 Pickup locator	.16
56		Control shaft spring	
57	1638	Safety spring	.06
58	2834	Speed control crank	.23
59	2891	Locator housing and lift rod Assembly	1.75
		1513 Lift rod assembly	.28
		1522 Pickup locator assembly	.68
		1620 Spring	.02
		1638 Safety spring	.06
		1650 "C" washer	.02
		1652 "C" washer	.02
		2793 locator housing	.63
61	1620	Spring	.02
62	1513	Lift rod assembly	.28
		1613 Lift rod	.23
		1616-B Adjusting screw	.02
63	1650	"C" washer for lift rod	.02
64	1519	Switch assembly	.84
		467 Switch only	.58
		1629 Switch plate	.06
65	709-A	Screw No. 6 x ¼" type "Z"	
66	1721	Reject spring	.05
67	2648	Set-Down locator plate	.10
68	1650	"C" washer	.02
69	1595	Cut-Off rod (part of item 75)	.12
70	1599	Spring (part of item 75)	.03
71		Link	
72		Flat washer	.02
73	2275	Hex screw	.02
74	1597	Roller	.03
75	2887	Lift arm assembly	1.86
		68 Roller drive pin	.05
		1595 Cut-Off rod	.12
		1596 Pin	.03
		1597 Roller	.03
		1599 Spring	.03
		2185 Rivet	.02
		2886 Lift arm	1.12
76	1637	Fiber washer 1/64" thick	.02
77	1922	Fiber washer 3/64" thick	.02
78		Internal tooth lock washer	
79	277	Screw No. 8-32 x ⅜"	.03
80	94	Rivet	.02
81	2789	Cam locator	.09
82	2796	Cam assembly	1.96
		94 Rivet	.02
		120 Lug	.02
		419 Spring	.13
		1547 Drive pin	.02
		1588 "C" washer	.02
		2388 Wire	.02
		2516 Spring washer	.03
		2760 Trip lever	.05
		2763 Cam only	.10
		2789 Cam locator	.09
		2795 Pawl assembly	.35
		2829 Fiber washer	.02
83	419	Spring	.13
84	2795	Trip pawl assembly	.35
85	2760	Trip lever	.10
86	2516	Spring washer	
87	1588	"C" washer for trip pawl assembly	.02
88	1653	Fiber washer	.02
89	1651	"C" washer for main cam	.02
90		Flat washer	.02
91	2388	Wire	

SEE PAGE 12 FOR ADDITIONAL PARTS INFORMATION

Part No.	DESCRIPTION	List Price
3211	Motor (Russell Turret 110 V.-60 cycle)	$17.50
	3353 Idler Wheel	1.61
	3354 Drive Pulley 33⅓ RPM	.70
	3356 Drive Pulley 45 RPM	.70
	3357 Drive Pulley 78 RPM	.70
	2638 Mounting Grommet	.06
	2765 Lever Grommet	.06
	NOTE: Above parts may also be used to service the following motors:	
3362	Motor (Russell Turret Deep Stack for G. E. 110 V. 60 cycle)	$19.00
3393	Motor (Russell Turret 110 V.-50 cycle)	19.00
3394	Motor (Russell Turret 220 V.-50 cycle)	19.00
	NOTE: Manufacturers of the various motors are designated by the following code:	
	Letter "G" on the mounting plate—General Industries	
	Letter "R" on the mounting plate—Russell Electric	